



Malaysian Communications and Multimedia Commission
Suruhanjaya Komunikasi dan Multimedia Malaysia

PUBLIC CONSULTATION PAPER

**Proposed Malaysian Preliminary Views (Round 1)
for World Radiocommunication Conference 2007
(WRC 2007) Agenda Items**

12 October 2005

PURPOSE OF PUBLIC CONSULTATION PAPER

The purpose of this paper is to invite public comments on the proposed Malaysian Preliminary Views on World Radiocommunication Conference 2007 (WRC2007) Agenda Items.

This is in view of submitting the first *Malaysian Preliminary Views at APG2007/03* (Asia Pacific Telecommunity Working Group for WRC2007) to be held in February 2006 for which Malaysia will be hosting.

BACKGROUND

The WRC is the international forum where Member States come together to revise an international treaty - the Radio Regulations, which contain not only allocations to over 40 radiocommunication services but also provide the technical, operational and regulatory conditions for the use of the radio frequency spectrum and satellite orbits. It is held every three to four years with the purpose of reaching consensus on changes in the Regulations.

The changes to the ITU Radio Regulations will result in changes and/or updates to our national spectrum plan and possible changes to our policy and regulatory matters.

In order to strike a balance between the often imperative need to get agreement so that businesses do not miss out on market opportunities without sacrificing national interests, a comprehensive working process need to be planned, regularly improvised and diligently implemented and executed hence the requirement for this Public Consultation process.

REQUEST FOR COMMENT

The MCMC hereby invites submissions from members of the public and participants of the industry on the issues raised in this paper concerning, among others, the procedures, processes, costs implications and technical solutions involved in coming out with Malaysia Preliminary View for WRC2007 Agenda Items.

Parties that have concerns on the frequency band/s and associated satellite orbits mentioned in any part of this document and parties that have proposal and/or comment on the current and future usage of the radio spectrum and satellite orbits are strongly encouraged to provide comment.

Written submissions, in electronic form (in Microsoft Word format), should be provided to the MCMC on or before 12.00 noon, **25 November 2005**.

SUBMISSION

Submissions should be addressed to:

The Chairman
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APPENDIX I :- MALAYSIAN PRELIMINARY VIEWS (ROUND1)

APPENDIX II :- WRC2007 AGENDA ITEMS

Malaysia**PRELIMINARY VIEWS ON WRC-07**

WRC-2007 Agenda Item 1.5: "To consider/study spectrum requirements and possible additional spectrum allocations for aeronautical telecommand and high bit rate aeronautical telemetry, in accordance with Resolution 230 (WRC-03)"

ISSUE :

- 1) Considering the spectrum required to satisfy wideband aeronautical mobile telemetry requirements and associated telecommand above 3 GHz;
- 2) Reviewing, with a view to upgrading to primary, the secondary allocations to the mobile service in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand;
- 3) Considering possible additional allocations to the mobile service, including aeronautical mobile, on a primary basis in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand;
- 4) Designating existing mobile allocations between 16 and 30 GHz for wideband aeronautical telemetry and associated telecommand.

BACKGROUND:

Resolution 230(WRC-03) *resolves* that WRC-07 be invited to:

- 1) Consider the spectrum required to satisfy justified wideband
- 2) Review, with a view to upgrading to primary, secondary allocations to the mobile service in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand;
- 3) Consider possible additional allocations to the mobile service, including aeronautical mobile, on a primary basis in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand, taking into account *considering d)* above;
- 4) Designate existing mobile allocations between 16 and 30 GHz for wideband aeronautical telemetry and associated telecommand,

Invites ITU-R to conduct, as a matter of urgency, studies to facilitate sharing between aeronautical mobile telemetry and the associated telecommand, on the one hand, and existing services, on the other hand, taking into account the resolves above.

There is a need to provide global spectrum to the mobile service for wideband aeronautical telemetry and command systems. There is also an identified need for additional spectrum required to meet future wideband aeronautical telemetry demands. This is needed due to the development of modern aircraft which requires extensive flight test programs to demonstrate and certify air worthiness of the airframe and the installations. A real time data link from the aircraft down to the ground control centre is essential to analyze data so the number of flights can be kept

to a minimum and the test programs can be dynamically adapted. This will result in improved testing capabilities, ensure significant cost savings and will shorten the aircraft development cycle. The overall necessary bandwidth for civil aircraft flight testing was preliminary estimated at the level of about 60 MHz in a frequency below 7GHz.

A proposed solution by some administrations considered the use of the band 5030-5150 MHz currently allocated to aeronautical radionavigation service in order to meet the 60 MHz bandwidth requirement and allocation of 60 MHz for the aeronautical mobile service within 5030-5150 MHz band. The MLS (Microwave Landing System) currently operates between 5030 and 5090 MHz. The future of this system between 5091-5150 is under review. The band 5091-5150 MHz is currently identified for the MLS and may be only used if MLS requirements cannot be satisfied in the band 5030-5091 MHz. There is presently no safety of life systems using the band 5091-5150 MHz.

Currently in Malaysia, there aren't any licensee using the spectrum range (5000-5150MHz) encompassing the proposed spectrum required for aeronautical telemetry and telecommand registered in the AFMS database. Under the Spectrum Plan, (5000-5150) MHz is allotted to Aeronautical Radionavigation on a Primary basis. Bands (5000-5010) MHz may be allotted for SNS & MLS for uplink and the bands (5010-5030) MHz is allotted for downlink.

MALAYSIA's PRELIMINARY VIEW (1.5) :

No preliminary view

Appendix: Spectrum Plan of Malaysia as Mentioned in Agenda 1.5

5000-5150	AERONAUTICAL RADIONAVIGATION 5.367 5.443A 5.443B 5.444 5.444A MLA34	Bands 5000 - 5010 MHz may be allocated for SNS and MLS (Up-link) Bands 5010 - 5030 MHz may be allocated for SNS and MLS (Down-link) MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information
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5.367 *Additional allocation:* The bands 1 610-1 626.5 MHz and 5 000-5 150 MHz are also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. **9.21**.

5.443A *Additional allocation:* The band 5 000-5 010 MHz is also allocated to the radionavigation-satellite service (Earth-to-space) on a primary basis. See Resolution **603 (WRC-2000)**. (WRC-2000)

- 5.443B** *Additional allocation:* The band 5 010-5 030 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed -124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, the aggregate power flux-density produced in the 4 990-5 000 MHz band by all the space stations within any radionavigation satellite service (space-to-Earth) system operating in the 5 010-5 030 MHz band shall not exceed the provisional value of -171 dB(W/m²) in a 10 MHz band at any radio astronomy observatory site for more than 2% of the time. For the use of this band, Resolution **604 (WRC-2000)** applies. (WRC-2000)
- 5.444** The band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **5.444A** and Resolution **114 (WRC-95)** apply. (WRC-2000)
- 5.444A** *Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems and is subject to coordination under No. **9.11A**. In the band 5 091-5 150 MHz, the following conditions also apply:
- prior to 1 January 2010, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (WRC-95)**;
 - prior to 1 January 2010, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
 - after 1 January 2008, no new assignments shall be made to stations providing feeder links of nongeostationary mobile-satellite systems;
 - after 1 January 2010, the fixed-satellite service will become secondary to the aeronautical radionavigation service.

* Please go to

http://www.mcmc.gov.my/what_we_do/spectrum/pdf/planv2_3.pdf

to view Malaysian Spectrum Plan for spectrum allocation between 3 GHz to 16 GHz
(page 113 to 135)

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item 1.6: "To consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, in accordance with Resolution **414 [COM7/6] (WRC-03)** and, to study current satellite frequency allocations, that will support the modernization of civil aviation telecommunication systems, taking into account Resolution **415 [COM7/7] (WRC-03)** ;"

ISSUES:

Issues to be studied in Resolution 414 (WRC-03)

Issue dealing with terrestrial aeronautical mobile (R) service :

1. To investigate, as a first step, the bands currently available for use by aeronautical systems in the frequency range between 108 MHz and 6 GHz in order to determine whether additional allocations to the aeronautical mobile (R) service are required and can be accommodated in these bands without placing undue constraints to services to which the frequency bands are currently allocated;
2. To further investigate, in case the first step above would not lead to satisfactory results, also the frequency bands currently not available for use by aeronautical systems, subject to not constraining the existing and planned use of such bands, taking account of existing use and future requirements in these bands;
3. To investigate how to accommodate the requirements for aeronautical systems in the band 5091-5 150 MHz.

Resolution 414 [COM7/6] (WRC-03)

That WRC-07 considers additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz.

Further resolves to invite ITU-R

1. To investigate, as a first step, the bands currently available for use by aeronautical systems in the frequency range between 108 MHz and 6 GHz in order to determine whether additional allocations to the aeronautical mobile (R) service are required and can be accommodated in these bands without placing undue constraints to services to which the frequency bands are currently allocated;
2. To further investigate, in case the first step above would not lead to satisfactory results, also the frequency bands currently not available for use by aeronautical systems, subject to not constraining the existing and planned use of such bands, taking account of existing use and future requirements in these bands;
3. To investigate how to accommodate the requirements for aeronautical systems in the band 5091-5 150 MHz,

Resolution 415 [COM7/7] (WRC-03);

Resolves to invite WRC-07

- 1) To examine the possibility of broadening the services and applications of the use of current satellite frequency allocations in order to allow the expansion of ICAO CNS/ATM systems that can also support other non-aeronautical telecommunication services;
- 2) To take appropriate actions, based on the results of the examination specified under *resolves 1,*

Invites ITU-R

- 1) To study, as a matter of urgency, the current satellite frequency allocations that could meet aeronautical requirements to support the modernization of civil aviation telecommunication systems, especially those in developing countries, and to study in particular those radio frequencies that could be used to support both ICAO CNS/ATM systems and other non-aeronautical telecommunication services,

Resolution 415 (WRC-03)

Resolution 415 (WRC-03) concerns the 'study of current satellite frequency allocations that will support the modernization of civil aviation telecommunication systems'. The resolution was drafted during WRC-03 based on a proposal from some African countries concerning the needs of the developing countries, in particular, the modernization of communication systems that will allow the developing countries to fully participate in the ICAO program of developing Communication, Navigation, Surveillance and Air Traffic Management systems (CNS/ATM) to enhance the safety and efficiency of civil aviation.

ICAO indicated its support for appropriate regulatory measures, in the Radio Regulations which recognize that VSAT networks operating in the fixed satellite service can also be used for aeronautical safety applications. These measures should include conditions to protect aeronautical telecommunications when (aeronautical) VSAT networks are also being used to provide non-aeronautical telecommunications

BACKGROUND:

During the preparations for the WRC-03, a proposal was made for a future agenda item concerning the additional allocations for Aeronautical Mobile(R) service between 108 MHz and 6 GHz. This proposal was brought to the attention of WRC-03, and as an outcome of the Conference, Resolution 414 (WRC-03) was adopted and the item was placed on the agenda for the WRC-07 under agenda item 1.6. Under this same agenda item, WRC-07 has to study current satellite frequency allocations that will support the modernization of civil aviation telecommunication systems taking into account Resolution 415 (WRC-03).

The reason behind the above proposal at WRC-03 was that a new system in the Aeronautical Mobile (R) Service (AM(R)S, terrestrial) and the need that additional spectrum resource are required to be in place by 2010 in order to overcome expected shortage in spectrum for line-of-sight air-ground communications. This would require a decision by WRC-07 on the necessary allocations. ICAO is also considering frequency bands, already allocated to aeronautical services, for the introduction of new technologies to support air navigation, including airborne and ground surveillance applications.

a) Resolution 414 (WRC-03)

Resolution **414 (WRC-03)** concerns the consideration of the frequency range between 108 MHz and 6 GHz for new aeronautical applications. The resolution was drafted during WRC-03 to combine the above proposal concerning the additional allocation for AM(R)S and proposal to review spectrum requirements for new civil aviation systems related to the provision of ground-based navigation and safety

communications in and around airports for aircraft on the ground, and consideration of allocations and/or regulatory provisions to accommodate such systems, particularly in the band 5091-5150 MHz.

ICAO is focusing its work in two bands: 960-1164 MHz and 5030-5150 MHz. There may also be a proposal for an allocation in order to permit the operation of the Universal Access Transceiver (UAT) systems in the band 960-1164 MHz. Another interesting band that could be also studied is the VOR (VHF Omni-directional range) band (112-118 MHz) as in those regions of the world where the needs are the most important (Europe and North America) the usage of VOR are decreasing.

b) Resolution 415 (WRC -03)

Resolution 415 (WRC-03) concerns the study of current satellite frequency allocations that will support the modernization of civil aviation telecommunication systems.

In the work in ICAO, two main issues were identified:

- a) The use of VSAT systems to overcome shortcomings in terrestrial ground-ground communication systems; and
- b) The use of (generic) mobile satellite systems that could support aeronautical CNS/ATM communications.

One Administration expressed its support to the allocation of the following bands for the use of the aeronautical mobile-satellite service on a secondary basis:

Region 1: 10.7-11.7 GHz and 12.5-12.75 GHz (s-E)

Region 2: 10.7-12.2 GHz (s-E)

Region 3: 10.7-11.7 GHz and 12.2-12.75 GHz (s-E),

providing such allocation does not have any adverse impact on existing services in these bands. This allocation is not intended to be used for aeronautical safety-of-life ICAO CNS/ATM communications.

In Malaysia the spectrum range ICAO mentioned to be focusing on with regards to Resolution 414;

a) 112-118 MHz – There are 2 users in this band, Jabatan Penerbangan Awam Malaysia (112.3-116.2 MHz and 173 MHz) and Petroleum National Bhd (117.1 MHz).

a) 960–1164 MHz - There are a 2 users in this spectrum range. Maxis Sdn. Bhd. occupies frequencies (Tx-960 MHz, Rx-915MHz and Tx-970.4 MHz, Rx-925.4MHz). Jabatan Penerbangan Awam Malaysia uses the rest of the spectrum accordingly starting from 983MHz till 1162MHz.

b) 5030–5150 MHz is currently unused, but the spectrum range is also under review to be used for wideband aeronautical telemetry and telecommand as listed in Agenda 1.5.

With regards to the spectrum mentioned in Resolution 415, Malaysia is located in Region 3, thus the suggested mentioned spectrum range for aeronautical mobile satellite service is from 10.7-11.7 GHz and 12.2GHz– 12.75 GHz.

- a) 10.7 -11.7 GHz– Heavily used by CELCOM Transmission (M) Sdn. Bhd. through out the entire spectrum range (10.715 – 11.645 GHz)
- b) 12.2-12.75 GHz – The only client listed using this spectrum is Maxis Mobile Sdn. Bhd. (Tx- 12745.5 MHz, Rx- 13020 MHz.)

MALAYSIA's PRELIMINARY VIEW (1.6):

No preliminary view

Appendix : Spectrum Plan of Malaysia as Mentioned in Agenda 1.6

87 – 108 MHz

87-100	FIXED MLA10 MOBILE MLA10 BROADCASTING	The bands between 87.5 MHz to 108 MHz are allocated for FM Radio Broadcasting MLA10: Suppressed
100-108	BROADCASTING	The bands between 87.5 MHz to 108 MHz are allocated for FM Radio Broadcasting

MLA10 Suppressed

108 – 117.975 MHz

108-117.975	AERONAUTICAL RADIONAVIGATION 5.197	
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5.197 *Additional allocation:* in Japan, Pakistan and Syria, the band 108-111.975 MHz is also allocated to the mobile service on a secondary basis, subject to agreement obtained under No. **9.21**. In order to ensure that harmful interference is not caused to stations of the aeronautical radionavigation service, stations of the mobile service shall not be introduced in the band until it is no longer required for the aeronautical radionavigation service by any administration which may be identified in the application of the procedures invoked under No. **9.21**. (WRC-2000)

960 – 1164 MHz

960-1215	AERONAUTICAL RADIONAVIGATION 5.328 5.328A	
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5.328 The use of the band 960-1 215 MHz by the aeronautical radionavigation service is reserved on a worldwide basis for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities. (WRC-2000)

5.328A *Additional allocation:* the band 1 164-1 215 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. The aggregate power flux-density produced by all the space stations of all radionavigation-satellite systems at the Earth's surface shall not exceed the provisional value of -115 dB(W/m²) in any 1 MHz band for all angles of arrival. Stations in the radionavigation-satellite service shall not cause harmful interference to, nor claim protection from, stations of the aeronautical-radionavigation service. The provisions of Resolution **605 (WRC-2000)** apply. (WRC-2000)

5091 – 5150 MHz

5000-5150	AERONAUTICAL RADIONAVIGATION 5.367 5.443A 5.443B 5.444 5.444A MLA34	Bands 5000 - 5010 MHz may be allocated for SNS and MLS (Up-link) Bands 5010 - 5030 MHz may be allocated for SNS and MLS (Down-link) MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information
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5.367 *Additional allocation:* The bands 1 610-1 626.5 MHz and 5 000-5 150 MHz are also allocated to the aeronautical mobile-satellite (R) service on a primary basis, subject to agreement obtained under No. **9.21**.

5.443A *Additional allocation:* The band 5 000-5 010 MHz is also allocated to the radionavigation-satellite service (Earth-to-space) on a primary basis. See Resolution **603 (WRC-2000)**. (WRC-2000)

5.443B *Additional allocation:* The band 5 010-5 030 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. In order not to cause harmful interference to the microwave landing system operating above 5 030 MHz, the aggregate power flux-density produced at the Earth's surface in the band 5 030-5 150 MHz by all the space stations within any radionavigation-satellite service system (space-to-Earth) operating in the band 5 010-5 030 MHz shall not exceed -124.5 dB(W/m²) in a 150 kHz band. In order not to cause harmful interference to the radio astronomy service in the band 4 990-5 000 MHz, the aggregate power flux-density produced in the 4 990-5 000 MHz band by all the space stations within any radionavigation satellite service (space-to-Earth) system operating in the 5 010-5 030 MHz band shall not exceed the provisional value of -171 dB(W/m²) in a 10 MHz band at any radio astronomy observatory site for more than 2% of the time. For the use of this band, Resolution **604 (WRC-2000)** applies. (WRC-2000)

5.444 The band 5 030-5 150 MHz is to be used for the operation of the international standard system (microwave landing system) for precision approach and landing. The requirements of this system shall take precedence over other uses of this band. For the use of this band, No. **5.444A** and Resolution **114 (WRC-95)** apply. (WRC-2000)

5.444A *Additional allocation:* the band 5 091-5 150 MHz is also allocated to the fixed-satellite service (Earth to-space) on a primary basis. This allocation is limited to feeder links of non-geostationary mobile-satellite systems and is subject to coordination under No. **9.11A**. In the band 5 091-5 150 MHz, the following conditions also apply:

- prior to 1 January 2010, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (WRC-95)**;
- prior to 1 January 2010, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
- after 1 January 2008, no new assignments shall be made to stations providing feeder links of nongeostationary mobile-satellite systems;
- after 1 January 2010, the fixed-satellite service will become secondary to the aeronautical radionavigation service.

10.7 – 11.7 GHz

10.7-11.7	<p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth) 5.441 5.484A MLA34</p> <p>MOBILE except aeronautical mobile</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>Possibility of band segmentation to accommodate FSS (Ku band)</p> <p>Bands from 10.9 – 11.7 GHz allocated to Fixed services, to be vacated by 2003.</p> <p>SRSP Ref: 518</p>
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5.441 The use of the bands 4 500-4 800 MHz (space-to-Earth), 6 725-7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to-Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix **30B**. The use of the bands 10.7-10.95 GHz (space-to Earth), 11.2-11.45 GHz (space-to-Earth) and 12.75-13.25 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)

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), 17.8-18.6 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)

12.2 – 12.75 GHz

12.2-12.5	<p>FIXED</p> <p>MOBILE except aeronautical mobile</p> <p>BROADCASTING</p> <p>5.484A 5.487 5.491</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information.</p> <p>Bands 12.2 - 12.5 GHz may be allocated for Fixed Satellite Services (downlink).</p>
12.5-12.75	<p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth) MLA34</p> <p>MOBILE except aeronautical mobile</p> <p>BROADCASTING – SATELLITE 5.493</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>Bands 12.2 - 12.5 GHz may be allocated for Fixed Satellite Services (downlink).</p>

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), 17.8-18.6 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)

5.487 In the band 11.7-12.5 GHz in Regions 1 and 3, the fixed, fixed-satellite, mobile, except aeronautical mobile, and broadcasting services, in accordance with their respective allocations, shall not cause harmful interference to, or claim protection from, broadcasting-satellite stations operating in accordance with the provisions of the Regions 1 and 3 Plan in Appendix **30**. (WRC-2000)

5.491 *Additional allocation:* in Region 3, the band 12.2-12.5 GHz is also allocated to the fixed-satellite service (space-to-Earth) on a primary basis. The power flux-density limits in Table **21-4** of Article **21** shall apply to this frequency band. The introduction of the service in relation to the broadcasting-satellite service in Region 1 shall follow the procedures specified in Article 7 of Appendix **30**, with the applicable frequency band extended to cover 12.2-12.5 GHz. (WRC-2000)

5.493 The broadcasting-satellite service in the band 12.5-12.75 GHz in Region 3 is limited to a power flux density not exceeding -111 dB(W/(m² · 27 MHz)) for all conditions and for all methods of modulation at the edge of the service area. (WRC-97)

WP 2

(Space Science Services)

[e-mail reflector: NPWG2007_WP2@cmc.gov.my]

Desk Officer;
Norazah Mohd. Nor

Consultative Committee;
Dr. Nafizah G. Khan (NSA)
Maszlan Ismail (Astronautics)

WRC Agenda Items: 1.2, 1.20, 1.21

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item 1.2: “to consider allocations and regulatory issues related to the Earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions **746 (WRC-03)** and **742 (WRC-03)**”

ISSUE:

1. Resolution **746 (WRC-03)** deals with allocations to science services. It deals on feasibility of sharing between meteorological satellites operating in the space-to-earth direction and the fixed service and fixed satellite service in the space-to-earth direction in the band 18.0-18.4 GHz.
2. Resolution **746 (WRC-03)** is also to determine sharing criteria between the EESS (passive) and the space research service (passive) on one hand and the fixed and mobile services on the other hand in the band 10.6-10.68 GHz;
3. Resolution **742 (WRC-03)** is issues on use of frequency band 36-37 GHz

BACKGROUND:

Resolution 746 indicates that a space-to-Earth meteorological-satellite (MetSat) allocation exists in the band 18.1-18.3 GHz, but that this allocation is not wide enough to support the data rates viewed as necessary by the Metsat service. The Metsat service wishes to use geostationary satellites to provide this service.

The band 18.0-18.4 GHz is allocated to the FSS in the space-to-Earth direction and in the Earth-to-space direction. The Earth-to-space allocations are limited to use by BSS feederlinks with the 18-18.1 GHz segment being part of the **Appendix 30A** BSS feederlink Plan for Regions 1 and 3, and the 18.1-18.4 GHz segment being non-planned. In the 18-18.4 GHz band GSO satellites, including Metsats in the band 18.1-18.3 GHz band, are subject to coordination under **No. 9.7** (and coordination threshold of $T/T = 6\%$).

Article 21 pfd limits for GSO FSS in the band 18.0-18.4 GHz range from -105 dB W/m^2 . MHz) to -115 dB (W/m^2 . MHz)) depending on angle of arrival. GSO FSS systems are either operating or being designed to operate up to these levels. Further, GSO FSS systems in these bands operate with small orbital spacing, e.g., 2 degrees. In Region 2, the 18.3-19.3 GHz band was identified by WRC-03 [**No. 5.516B**] for deployment of High Density FSS (HDFSS) earth stations, and thus plans for use of the 18.3-18.4 GHz band by high power satellites operating with ubiquitously deployed small Earth stations are well advanced.

BSS feeder links systems generally use a relatively small number of large feeder link earth stations, which may facilitate the sharing situation for the terrestrial paths (FSS earth station interfering into MetSat receiving earth stations).

The 100 MHz extension may be possible if the limits given in **Table 21-4 of RR Article 21** be applicable to this extended band. According to **No. 5.519** these limits protect the existing and planned stations of the terrestrial services. Protection of the planned FSS stations should be provided in the process of coordination of the satellite networks according to **RR Article 9**.

ITU-R WP-7B has the lead in preparing CPM text for this agenda item. Presently, ITU-R WP7B and WP7C are conducting sharing studies between scientific services, and the fixed and fixed satellite services as well as the intervals between the satellites orbits.

ITU-R RR04

Allocation to services		
Region 1	Region 2	Region 3
17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	17.7-17.8 FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.518 5.515 5.517	17.7-18.1 FIXED FIXED -SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE
	17.8-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	
18.1-18.4	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 MOBILE 5.519 5.521	

Malaysia table of allocation

Frequency Band (GHz)	Malaysian Allocation	Notes/Future use
17.7-18.1	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MLA34 MOBILE	MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information Bands 17.7 - 22.2 GHz may be allocated for VSAT (Down-link) Ka-band A portion of the band is allocated for Fixed Links
18.1-18.4	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.520 MLA34 MOBILE 5.519	MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information Bands 17.7 - 22.2 GHz may be allocated for VSAT (Down-link) Ka-band. A portion of the band is allocated for Fixed Links

Additional Reference: MCMC SRSP527 (Standard radio System Plan 527 – requirement for Line-of-sight radio relay systems operating in the fixed service in the frequency band 17.70GHz to 19.7 GHz)

Additionally Resolution 746 recognizes that;

1. the provisions given in No. 5.482 may not be sufficient to ensure the protection of the EESS (passive) in the band 10.6-10.68 GHz; and
2. sharing criteria between the EESS (passive) and the space research (passive) service on one hand and other primary services on the other hand need to be reviewed in the band 10.6-10.68 GHz,

ITU-R RR04

Allocation to services		
Region 1	Region 2	Region 3
10.6-10.68	EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482	

Malaysia table of allocation

Frequency Band (GHz)	Malaysian Allocation	Notes/Future use
10.6-10.68	EARTH EXPLORATION-SATELLITE (passive) FIXED MLA35 MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation 5.149 5.482	Bands 10.6 – 10.7 GHz allocated to ESS MLA35: The frequency bands 3400 – 3700 MHz, 10000 – 10700 MHz are allocated for Fixed Wireless Access (FWA) service.

Additional Reference: MCMC SRSP507b (Standard radio System Plan 507b – requirement for Fixed Wireless Access (FWA) systems operating in the frequency band 10000MHz to 10700MHz)

Resolution **742 (WRC-03)** - Use of the frequency band 36-37 GHz

Resolves

1 to invite ITU-R to conduct sharing studies between the passive services and the fixed and mobile services in the band 36-37 GHz in order to define appropriate sharing criteria;

In determining the appropriate sharing criteria between the services in the band 36-37 GHz allocated on the primary basis to the EESS (passive), SRS (passive) and to the fixed and mobile services it is necessary that they shall not constrain the development and use of the fixed service in this band. At present this band is not used in Malaysia.

MALAYSIA's PRELIMINARY VIEW (1.2) :

1. Malaysia supports ongoing ITU-R studies on this issue in both the 18.0-18.1 GHz and the 18.3-18.4 GHz bands.
2. Regarding the sharing discussions on the Earth exploration-satellite (passive) service and the space research (passive) service and the fixed and mobile services, in the bands 10.6-10.68 GHz. sharing criteria should be appropriately defined based on the results of the ITU-R studies. Additionally, in determining the appropriate sharing criteria it is necessary that the limits given in **No 5.482** applied to the fixed service shall not be more stringent. Revision of these limits may be considered when the appropriate ITU-R studies be carried out.
3. In determining the appropriate sharing criteria between the services in the band 36-37 GHz allocated on the primary basis to the EESS (passive), SRS (passive) and to the fixed and mobile services it is necessary that they shall not constrain the development and use of the fixed and mobile services in this band.

ANNEX A:

ITU Table of allocation (see above)
Malaysia table of allocation (see above)

ANNEX B:

Information on existing users

- Band **18.1 – 18.4 GHz** is mainly used by Celcom and DiGi. Additionally this band is also used by Maxis, TM Cellular and Jaring.
- Band **10.6 - 10.68 GHz** is used quite extensively by Celcom (Microwave fixed link)
- There is no current user for **36 – 37 GHz** band.

ANNEX C:

Up to 5 year plan for the affected band (TBD)
5 – 15 years plan for the affected band (TBD)

ANNEX D:

Positions taken by some other countries/organizations- for comparison

Annex 11 to Working Party 7C Chairman’s Report (30 Mar2005)

DRAFT CPM REPORT TEXT

Agenda item 1.2

(Working Parties 7B, 7C / 4A, 8A, 9D, 8A, 9B)

to consider allocations and regulatory issues related to the Earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions 746 (WRC-03) and 742 (WRC-03)

Resolution 746 (WRC-03)

Issues dealing with allocations to science services

2/1.2/1 ISSUE (A) RESOLVES 1

to invite ITU-R to conduct sharing analyses between geostationary meteorological satellites operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary meteorological satellites allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum

2/1.2/1.1 Background

[Text to be provided by Working Party 7B]

2/1.2/2 Issue (B) resolves 2

to invite ITU-R to conduct sharing analyses between the EESS (passive) and the SRS (passive) on one hand and the fixed and mobile services on the other hand in the band 10.6-10.68 GHz to determine appropriate sharing criteria

2/1.2/2.1 Background

The band 10.6-10.68 GHz is allocated to the Earth exploration-satellite service (EESS) (passive), radio astronomy and space research (passive) services on a primary basis. The 10.6-10.68 GHz band is also allocated to the fixed service (FS) and the mobile service (MS) on a primary basis. RR No. **5.482** limits the e.i.r.p. of FS and MS stations in this band to 40 dBW and the transmitter power to -3 dBW, except in the 30 countries listed in this footnote.

The provisions given in No. **5.482** may not be sufficient to ensure the protection of the EESS (passive) in the band 10.6-10.68 GHz, therefore the sharing criteria between the EESS (passive) and the space research (passive) service on one hand and the other primary services on the other hand need to be reviewed.

The band 10.6-10.7 GHz is of primary interest to measure rain, snow, sea state and ocean wind. EESS sensors operating in this band typically employ a conical scan configuration centered on the nadir direction. It is important for the interpretation of surface measurements to maintain the constant ground incidence angle along the entire scan lines provided by this configuration. The scanning period is chosen in order to ensure full coverage and optimum integration time (radiometric resolution).

[NOTE – Additional text needed to describe use of the band by passive sensors and typical types of passive sensors that use this band as well as the use of the band by fixed and mobile systems.]

2/1.2/2.2 Summary of technical and operational studies and relevant ITU-R Recommendations

Relevant ITU-R Recommendations

Recommendation ITU-R SA.515: Frequency bands and bandwidths used for satellite passive services;

Recommendation ITU-R SA.1028: Performance criteria for satellite passive remote sensing;

Recommendation ITU-R SA.1029: Interference criteria for satellite passive remote sensing.

2/1.2/2.3 Analysis of the results of studies

2/1.2/2.3/1 Active systems considered

Sharing studies were conducted using FS parameters for point-to-point (P-P) and point-to-multipoint (P-MP) FS systems provided in Recommendation ITU-R F.758 and by administrations in contributions to the working parties performing the sharing studies.

The FS deployment models used in compatibility studies in this band assumed that FS systems are predominantly deployed in urban and sub-urban areas, with few if any systems in rural areas. The FS deployment model in this band was based on an assumption of [number to be specified] urban/sub-urban areas in the world, and a [to be specified] density of P-P FS deployment within these areas. For the P-MP system addressed in the studies for the 10.6-10.68 GHz band, two such systems were assumed for interference simulations based on the Recommendation ITU-R F.1568 channel plan.

[The technical parameters and deployment models of mobile service systems needed for sharing studies are not currently available.]

Additional details may be found in [reference to be supplied].

2/1.2/2.3/2 Study methodology

Sharing studies were conducted using dynamic model simulations. These simulations developed cumulative distribution functions (CDFs) of received interference levels over a 10 million square kilometre measurement area as required by Recommendation ITU-R SA.1029-2. These simulations addressed several different measurement areas in different parts of the world and their different assumed P-P and P-MP FS deployment models.

2/1.2/2.3/3 Results of Studies

The interference levels resulting from the initial studies based on the assumed FS deployment densities exceed the interference criteria of Recommendation ITU-R SA.1029-2 although areas for further study have been identified, which may reduce these calculated interference levels. Additional details may be found in [reference to be supplied].

2/1.2/2.3/4 Development of sharing criteria

The following technical and operational characteristics of an EESS (passive) instrument can be used in order to mitigate or minimize the chance of interference:

- A limitation on the maximum incidence angle controls the amplitude of the direct coupling between the terrestrial active services and the EES (passive) receiver;
- A requirement for a minimum main beam efficiency¹ directly controls the shape of the antenna pattern and will enable a decrease of interference power received outside the main beam region. ;
- A limit on the spatial resolution could decrease the likelihood of interferers, or the number thereof, within a certain pixel of the EESS (passive) instrument.

[Similar technical and operational characteristics need to be identified here for the fixed and mobile services on e.g. elevation angle (minimum, maximum), max eirp, antenna pattern and deployment scenarios.]

Control of a combination of some or all of the technical and operational characteristics listed in Table 1 can greatly help the sharing between EESS (passive) on one hand and the fixed and mobile services on the other hand.

TABLE 1

Possible sharing criteria in the band 10.6–10.68 GHz

EESS (passive)	Fixed Service	Mobile Service
incidence angle < [60] deg	elevation angle range?	elevation angle range?
main beam efficiency > [85] %	antenna pattern?	antenna pattern?
spatial resolution < [50] km	deployment?	deployment?
	max eirp?	max eirp?

Resolution 742 (WRC-03)

Use of the frequency band 36-37 GHz

2/1.2/3 Issue (C) resolves 1

to invite ITU-R to conduct sharing studies between the passive services and the fixed and mobile services in the band 36-37 GHz in order to define appropriate sharing criteria

¹ The main beam efficiency is defined as the energy (main & cross-polarization components) within the main beam region, relative to the total energy within all angles. The main beam region is defined here as 2.5 times the HalfPower (-3 dB) Beam Width (HPBW). The Half Power Beam Width is specified as the angle encompassed between the points where the power has fallen 3 dB below the maximum value.

2/1.2/3.1 Background

The band 36-37 GHz on one hand is allocated to the Earth exploration-satellite service (EESS) (passive) and to the space research service (SRS) (passive) and on the other hand is allocated to the fixed and mobile service, all on a primary basis. EESS (passive) and SRS (passive) operating in this band could receive interference from the emissions of systems of active services. Therefore, sharing criteria between the passive services and the active services need to be defined for the band 36-37 GHz.

The band 36-37 GHz is vital for the study of global water circulation: this band is able to monitor rain, snow and ocean ice. [NOTE – Additional text needed to describe use of the band by passive sensors and typical types of passive sensors that use this band from page 2]

2/1.2/3.2 Summary of technical and operational studies and relevant ITU-R Recommendations

Relevant ITU-R Recommendations

Recommendation ITU-R SA.515: Frequency bands and bandwidths used for satellite passive services;

Recommendation ITU-R SA.1028: Performance criteria for satellite passive remote sensing;

Recommendation ITU-R SA.1029: Interference criteria for satellite passive remote sensing.

2/1.2/3.3 Analysis of the results of studies

2/1.2/3.3/1 Active systems considered

Recommendation ITU-R F.758 lists various point-to-point (P-P) and point-to-multipoint (P-MP) FS system parameters for frequency sharing studies. With respect to P-MP systems in the 36-37 GHz band, Table 31 of that recommendation provides representative characteristics for the 30-40 GHz range, but no specific system characteristics are listed for the 36-37 GHz band. Although FS parameters were submitted by administrations for use in sharing studies, few administrations indicated any current use of the band.

Although FS systems are likely to be predominantly deployed in urban and sub-urban areas, with few if any systems in rural areas, in this band, the very limited use currently being made of this band, a parametric approach that compares the interference levels produced by FS systems into passive sensors over a range of FS parameters such as transmitter power or e.i.r.p. and FS station deployment density provided the most practical approach to conducting the initial sharing studies. [The technical parameters and deployment models of mobile service systems needed for sharing studies are not currently available.]

Additional details may be found in [reference to be supplied].

2/1.2/3.3/2 Study methodology

Sharing studies were conducted using dynamic model simulations. These simulations developed cumulative distribution functions (CDFs) of received interference levels over a 10 million square kilometre measurement area as required by Recommendation ITU-R SA.1029-2. These simulations addressed several different measurement areas in different parts of the world and their different assumed P-P and P-MP FS deployment models.

2/1.2/3.3/3 Results of Studies

The interference levels resulting from the initial studies based on the assumed FS deployment densities exceed the interference criteria of Recommendation ITU-R SA.1029-2 although areas for further study have been identified, which may reduce these calculated interference levels.

Additional details may be found in [reference to be supplied].

2/1.2/3.3/4 Development of sharing criteria

The following technical and operational characteristics of an EESS (passive) instrument can be used in order to mitigate or minimize the chance of interference:

- A limitation on the maximum incidence angle controls the amplitude of the direct coupling between the terrestrial active services and the EES (passive) receiver;
- A requirement for a minimum main beam efficiency directly controls the shape of the antenna pattern and will enable a decrease of interference power received outside the main beam region;
- A limit on the spatial resolution could decrease the likelihood of interferers, or the number thereof, within a certain pixel of the EES (passive) instrument.

[Similar technical and operational characteristics need to be identified here for the fixed and mobile services on e.g. elevation angle (minimum, maximum), max eirp, antenna pattern and deployment scenarios.]

Control of a combination of some or all of the operational and technical characteristics listed in Table 2 can greatly help the sharing between EESS (passive) on one hand and the fixed and mobile services on the other hand.

TABLE 2

Possible sharing criteria in the band 36– 37 GHz

EESS (passive)	Fixed Service	Mobile Service
incidence angle < [60] deg	elevation angle range?	elevation angle range?
main beam efficiency > [92] %	antenna pattern?	antenna pattern?
spatial resolution < [50] km	deployment?	deployment?
	max eirp?	max eirp?

2/1.2/4 Methods to satisfy the agenda item

2/1.2/4.1 Method to satisfy Issue A

(to be developed)

2/1.2/4.2 Method to satisfy Issue B

Method B1

Develop a footnote in Article 5 of the RR containing the sharing criteria given in Table 1

Method B2

Develop 3 Recommendations (SA-series, F-series and M-series) covering the sharing criteria given in Table 1

2/1.2/4.3 Method to satisfy Issue C

Method C1

Develop a footnote in Article 5 of the RR containing the sharing criteria given in Table 2

Method C2

Develop 3 Recommendations (SA-series, F-series and M-series) covering the sharing criteria given in Table 2

2/1.2/5 Regulatory and procedural considerations

Working party 4A (20 June 2005)

LIAISON STATEMENT TO WORKING PARTY 7B CONTAINING PROPOSED DRAFT ELEMENTS FOR CPM TEXT FOR WRC-07 AGENDA ITEM 1.2

Considering the general agreement between Working Party 4A and Working Party 7B as to the results of overall compatibility studies between future geostationary MetSat systems and FSS systems in the 18 GHz band (see Doc. 4A/TEMP/97), Working Party 4A offers the following proposed draft elements for those sections of the CPM report addressing this issue. WP 4A notes that much of this text was extracted directly from Doc. 4A/147 (i.e. the WP 7B liaison statement to WP 4A) and that this extracted text has been placed into the agreed CPM structure format. WP 4A asks that these draft elements be considered by WP 7B in production of the final CPM text on this issue, and that WP 4A be kept informed of WP 7B's progress on the development of this CPM text.

Resolution 746 (WRC-03)

Issues dealing with allocations to science services.

2/1.2/1 Issue (A) resolves 1

to invite ITU-R to conduct sharing analyses between geostationary meteorological satellites operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary meteorological satellites allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum

2/1.2/1.1 Background

Under Agenda Item 1.2 of WRC-07, the ITU-R has been invited to conduct sharing studies between geostationary meteorological satellites (MetSats) operating in the space-to-Earth direction and the fixed, fixed-satellite and mobile services in the band 18-18.4 GHz to define appropriate sharing criteria with a view to extending the current 18.1-18.3 GHz geostationary MetSat allocation in the space-to-Earth direction to 300 MHz of contiguous spectrum.

An expansion of the current MetSat allocation is desirable as the next generation geostationary MetSat systems are expected to have bandwidth requirements up to 300 MHz. This is primarily due to transmission of high rate data from high resolution sensors. Frequencies around 18 GHz are suitable for transmission of this high rate data considering, in particular, that a primary allocation to the geostationary MetSat (space-to-Earth) service exists already in the band 18.1-18.3 GHz based on No. 5.519 of the Radio Regulations (RR). WRC-03 recognized that the bandwidth of the existing allocation is insufficient to support the required data rates and that sharing between geostationary MetSats and the fixed, fixed-satellite and mobile services may be feasible in an additional 100 MHz in the band 18.0-18.4 GHz. This recognition of sharing feasibility was due to various considerations, including the fact that the number of MetSat satellites to be operated in this band would be quite limited (on the order of one or two per ITU Region or five to ten on a global basis), that the number of earth stations deployed to support these MetSat systems will be of the same order as the number of satellites, and that the antennas of these supporting earth stations would be relatively large (on the order of 6-10 meters in diameter).

2/1.2/1.2 Summary of technical and operational studies and relevant ITU-R Recommendations

Two options for an extension of RR footnote No 5.519 were studied, those being from 18.3-18.4 GHz and from 18.0-18.1 GHz. The overall results of the compatibility analyses can be summarized as follows:

- To protect FSS systems with typical beam edge of coverage PFD levels of -122 dBW/m²/MHz to -123 dBW/m²/MHz the required angular separation on the GSO for

typical MetSat PFD levels of $-122 \text{ dBW/m}^2/\text{MHz}$ and a worst case deployment of an FSS earth station within the MetSat satellite antenna main lobe, is generally below 2 degrees, except for the case of small HDFSS type earth stations where the required separation is generally below 3 degrees. For FSS earth station deployment outside the main lobe, the required separation is fractions of a degree.

- To protect MetSat systems, the required angular separation on the GSO for typical FSS PFD levels of $-118 \text{ dBW/m}^2/\text{MHz}$ and a worst case deployment of a MetSat earth station within the FSS satellite antenna main lobe, is generally below 2 degrees. For MetSat earth station deployment outside the main lobe, the required separation is fractions of a degree. PFD levels up to $-115 \text{ dBW/m}^2/\text{MHz}$ are tolerable without requiring special countermeasures. Higher PFD levels would require a wider angular separation.
 - Typical separation distances in reverse band sharing situations between receiving meteorological earth stations and transmitting BSS feeder uplinks are limited to the first line of sight obstacle. In the worst case, around 40 km separation is required. International coordination will therefore rarely be required.
 - Interference from geostationary meteorological satellites transmitting in the 18.0-18.1 GHz band to satellites receiving a BSS feeder link in this band may be acceptable for systems separated by greater than 1° .
 - The high gain satellite antennas will have a narrow main lobe footprint on the surface of the Earth which will greatly reduce angular separation requirements and consequently facilitate coordination.
 - Application of the $\pm 8^\circ$ coordination arc that currently applies to the case of FSS-to-FSS coordination in the 18 GHz band to the case of FSS-to-MetSat coordination across the entire 300 MHz of spectrum identified for MetSat operations would be appropriate
- Compatibility between MetSat systems and NGSO FSS systems has not been studied.

2/1.2/1.3 Analysis of the results of studies

In addition to the overall results of the technical studies, it must be noted from a practical standpoint that in Region 2, the 18.3-18.4 GHz band has been identified for use by HDFSS systems under RR **No. 5.516B** and this is expected to lead to increasing commercial use of this band. This increased use by FSS systems communicating with large numbers of ubiquitously deployed small earth stations will make MetSat coordination with the FSS in Region 2 more complicated in the band 18.3-18.4 GHz and this would suggest that the 18.0-18.1 GHz band may be a better choice for this application in Region 2.

In Regions 1 and 3, the 18.0-18.1 GHz band segment, apart from being used for FSS downlinks, is part of Appendix 30A (see RR **No. 5.516**) which shall not be constrained by this new MetSat allocation. Considering, however, the small number of meteorological satellites to be deployed, proper choice of orbital location of MetSat satellites, as stated in Section 2/1.2/1.2, will ensure continued protection of satellites operating under Appendix 30A. Considering also the small number of meteorological earth stations and BSS feeder link earth stations, careful selection of the location of meteorological earth stations in particular countries could eliminate the need to coordinate with feeder link stations of BSS satellite networks in neighbouring countries. This would ensure continued protection of BSS feeder links operating under Appendix 30A. Therefore, consideration of the 18.0-18.3 GHz band for MetSat operation would provide the best choice for a global allocation for this service.

2/1.2/4 **Methods to satisfy the agenda item**

(TBD)

2/1.2/5 **Regulatory and procedural considerations**

(TBD)

Working Party 9D (17 May 2005)

LIAISON STATEMENT TO WORKING PARTY 7C

**STUDIES RELATING TO AGENDA ITEM 1.2 AND
DRAFT CPM REPORT TEXT**

Working Party 9D thanks Working Party 7C for its liaison statement in Document 9D/87. Working Party 9D reviewed the summary of sharing studies and preliminary draft CPM Report text provided in Attachments 1 and 2 to your liaison statement. Working Party 9D believes that these documents represent significant progress in the studies required for WRC-07 Agenda item 1.2, and generally agrees that the work plan described in Sections 2.4 and 3.4 of Attachment 1 to your liaison statement is an appropriate way to progress this work. Working Party 9D offers the following additional specific comments,

Working Party 9D notes that similar studies have been submitted to it and are summarized in the two Working Documents towards preliminary draft new Recommendations contained in Documents 9D/123, Annexes 4 and 5 (Documents 9D/TEMP/65 and 9D/TEMP/64). Although the parameters assumed for the fixed service (FS) and passive sensors, and the simulation methodologies used in the studies appear to be converging, a careful review is needed to ensure consistency between the studies to be reflected in the CPM Report.

One example where such verification is desirable is related to item a) of section 2.4 of Attachment 1 to your liaison statement dealing with 10.6 GHz passive sensors. Working Party 9D notes that clarification is needed on why the CMIS antenna diameter and gain indicated in the studies for the 10.6-10.68 GHz band are larger than the corresponding values for AMSR-E, but the beamwidth is larger.

Working Party 9D recognizes the critical dependence of the simulation results on the FS deployment model assumed, and has requested contributions from its members on this matter. Although no such contributions were received at this meeting, discussions during the meeting indicated that frequency re-use was likely in areas of significant FS deployment, particularly along point-to-point FS routes. However, the level of such frequency re-use is not presently available. Administrations were requested to provide information on actual FS station deployments for use in future simulation studies.

Working Party 9D also agrees that use of maximum permitted FS powers and gains in simulations are likely to overestimate the predicted FS interference levels. It has requested administrations to provide information on the statistical distribution of these parameters, and other parameters such as FS elevation angles and path lengths, based on actual FS deployments for use in future simulations. Working Party 9D appreciates Working Party 7C's listing of several mitigating factors that might be undertaken by the EESS (passive) service. With respect to the possible factors indicated for the FS, Working Party 9D does not believe that variations in FS antenna patterns are likely to improve the situation beyond the reference antenna patterns provided in Recommendations ITU-R F.1245 and ITU-R F.1336. In this regard, it should be noted that April 2005 meeting of Working Party 9D

approved a draft revised Recommendation F.1336-1 that would be applicable to future studies involving point-to-multipoint FS systems.

With respect to passive sensor incidence angle and FS station elevation angles, Working Party 9D believes it would be useful to study the sensitivity of the received interference levels to variations in these parameters. Studies involving the sensitivity of the passive sensor interference levels to variations in FS transmitter power as indicated in Tables 1 and 2 of the draft CPM test would also be useful.

It is not clear what is intended by the inclusion of “deployment” in Tables 1 and 2 of the draft CPM text, or how it would be related to the other factors indicated. Working Party 9D requests further clarification of the intent of indicating such a factor before giving it further consideration.

Finally, one area where further information would be beneficial is a more detailed explanation of the impact of interference levels exceeding the limits in Recommendation ITU-R SA.1029-2 on the data being measured and collected and the final application products, as well as an assessment of the feasibility of any processing techniques to identify or correct any measurement data corrupted by interference.

Working Party 9D looks forward to our cooperative efforts in progressing these studies in preparation for WRC-07.

ANNEX E:

ITU Study Group/Task Group - schedule of reports and results

Lead Working Party(s): WP 7B, WP 7C

Involved Working Parties: WP 4A, WP 7B, WP 7C, WP 8A, WP 9D

From	to	ITU-R SG/WP	Responsibility
2005-11-08	2005-11-09	<u>WP 7B</u>	Space radio systems
2005-11-08	2005-11-14	<u>WP 7C</u>	Earth-exploration satellite systems and meteorological elements
2005-11-15	2005-11-15	<u>SG 7</u>	Science services
2006-04-03	2006-04-07	<u>WP 7B</u>	Space radio systems
2006-04-03	2006-04-07	<u>WP 7C</u>	Earth-exploration satellite systems and meteorological elements
2006-08-25	2006-08-25	<u>SG 7</u>	Science services
2006-08-28	2006-08-31	<u>WP 7B</u>	Space radio systems
2006-08-28	2006-08-31	<u>WP 7C</u>	Earth-exploration satellite systems and meteorological elements
2006-09-01	2006-09-01	<u>SG 7</u>	Science services
2007-03-19	2007-03-19	<u>SG 7</u>	Science services
2007-03-20	2007-03-26	<u>WP 7B</u>	Space radio systems

Report on the meeting of Working Party 7B, 7-11 March 2005
Report on the meeting of Working Party 7C, 7-11 March 2005

ANNEX F:

Implication /Impact for this Agenda Item to the country

Additional Note:

WRC 2007 Agenda Item 1.2

Issue A: Resolution 746

1. Request for comment regarding use of **18.0 – 18.1 GHz** or **18.3 – 18.4 GHz** for meteorological satellites operating in the space-to-earth direction which. Meteorological satellite is currently operating at 18.2 to 18.3 GHz sharing with Fixed Service (FS) and Fixed satellite Service (FSS).
2. Current FS operators (**Celcom, DiGi, Maxis, TM Cellular, Jaring**) are requested to look into feasibility of sharing in this band.
3. FSS operator (**Measat**) is requested to look into sharing feasibility and parameters for the said band.
4. **Meteorological Department** is requested to look into its requirement and indicate whether or not this agenda need support from Malaysia. Meteorological department is also requested to indicate its plan for this band (5 years plan and 5-15 years plan).

Issue B: Resolution 746

5. Request for comment regarding sharing criteria between EESS(passive) and Space Research Service (passive) with fixed and Mobile Service at **10.6 – 10.68 GHz**.
6. Current FS operator (**DiGi**) is requested to look into feasibility of sharing in this band.
7. Associated Agencies (**Astronautics, National Space Agencies etc**) are requested to look into their requirement and indicate their plan for this band (5 years plan and 5-15 years plan)

Issue C: Resolution 742

8. Request for comment regarding sharing criteria between passive service and the Fixed and Mobile Services at **36 – 37 GHz**.
9. Currently there is no registered user in this band.

10. Associated Agencies (**Astronautics, National Space Agencies, Ministry of Defense etc**) are requested to look into their requirement and indicate their plan for this band (5 years plan and 5-15 years plan)

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item 1.20: “to consider the results of studies, and proposals for regulatory measures if appropriate regarding the protection of the EESS (passive) from unwanted emissions of active services in accordance with Resolution 738 (WRC-03)”

ISSUE:

1. to invite ITU-R to continue or to initiate studies on the compatibility analyses between EESS (passive) and the corresponding active services as listed in the Table with a view to updating Recommendation ITU-R SM.1633 or developing additional Recommendations;

TABLE

EESS (passive) band	Active service band	Active service
1 400-1 427 MHz	1 350-1 400 MHz	Fixed service (FS) Mobile service (MS) Radiolocation service
1 400-1 427 MHz	1 427-1 429 MHz	FS, MS (except aeronautical mobile service) and space research service (Earth-to-space)
1 400-1 427 MHz	1 429-1 452 MHz	FS and MS
23.6-24 GHz	22.55-23.55 GHz	Inter-satellite service
31.3-31.5 GHz	30-31 GHz	FSS (Earth-to-space)
50.2-50.4 GHz ¹	50.4-51.4 GHz ¹	FSS (Earth-to-space) ¹
50.2-50.4 GHz ¹	47.2-50.2 GHz (Regions 2 and 3) 49.44-50.2 GHz ¹ (Region 1)	FSS ¹

¹ Studies in this band must take into account No. **5.340.1** of the Radio Regulations.

2. to consider regulatory measures, if appropriate, to ensure the protection of the EESS (passive) operating in the bands listed in the Table from unwanted emissions of active services operating in the corresponding bands while taking into account the impact on all concerned services of implementing or not implementing such measures,

BACKGROUND: Agenda 1.20 was established to continue the consideration on protection of Earth exploration-satellite (passive) service from unwanted emissions because WRC-03 could not reach consensus in the agenda item 1.8.2. The Regulatory measures will be considered to regulate unwanted emissions in frequencies stipulated in Resolution 738. Furthermore, consideration will be made also for Regions 2 and 3 regarding the regulated values stated in Recommendation SM.1633 on the unwanted emissions to Earth exploration-satellite service (passive) from fixed services in Region 1, which has already been discussed.

ITU-R TG1/9 is studying this agenda. A working document on the CPM report format was created at the TG1/9 which was held in April 2004 and various solutions to regulate for the protection of Earth exploration-satellite service (passive) were organized.

Recommendation ITU-R SM.1633 provides a list of band-pairs and a methodology for conducting, and a framework for documenting the results of, the compatibility studies between active and passive services operating in adjacent and nearby bands;

MALAYSIA's PRELIMINARY VIEW (1.20):

No preliminary view

Annex 1 to TG 1/9 Chairman's Report (21 Sept 2005)

**Working document toward draft CPM text for WRC-07
Agenda item 1.20 (Chapter 2 of the CPM Report)**

Agenda item 1.20 (TG 1/9 – WPs 7C, 4A, 8D, 9B, 9D – SG 6)

to consider the results of studies, and proposal for regulatory measures, if appropriate, regarding the protection of the Earth exploration-satellite service (passive) from unwanted emissions of active services in accordance with Resolution 738 (WRC-03)

Resolution 738 (WRC-03)

Compatibility analyses between the Earth exploration-satellite service (passive) and active services

2/1.20/1 Issue (A) resolves 1

to invite ITU-R to continue or to initiate studies on the compatibility analyses between EESS (passive) and the corresponding active services as listed in the Table with a view to updating Recommendation ITU-R SM.1633 or developing additional Recommendations

2/1.20/1.1 Background

2/1.20/1.2 Summary of technical and operational studies, and relevant ITU-R Recommendations

For the pairs of active and passive service frequency bands listed in the Table in Resolution 738 (WRC-03) studies of the required protection of the EESS (passive) allocations, as well as the impact on active services, have been documented in Recommendation ITU-R SM.1633. In addition to Recommendation ITU-R SM.1633, other relevant Recommendations include Recommendation ITU-R SA.1029. The following sections provide summaries of studies for the band pairs considered.

[Editor's Note: These sections will summarize the EESS (passive) use of the bands, the potential impact of interference to remote sensing, the requirements for protection from unwanted emissions

interference, the methodology used to determine these requirements, any qualification of the methodology used, and the impact of such requirements on the active services.]

2/1.20/1.2.1 EESS (passive) service in the 1 400-1 427 MHz band and fixed service in the 1 350-1 400 MHz and 1 427-1 452 MHz bands

[Summary based on Annex [FS-EESS-1.4 GHz] of Recommendation ITU-R SM.1633.]

2/1.20/1.2.2 EESS (passive) service in the 1 400-1 427 MHz band and mobile service in the 1 350-1 400 MHz and 1 427-1 452 MHz bands

[Summary based on Annex [MS-EESS-1.4 GHz] of Recommendation ITU-R SM.1633.]

2/1.20/1.2.3 EESS (passive) service in the 1 400-1 427 MHz band and radiolocation service in the 1 350-1 400 MHz band

[Summary based on proposed modifications of Annex 3 of Recommendation ITU-R SM.1633.]

2/1.20/1.2.4 EESS (passive) service in the 1 400-1 427 MHz band and space operation (Earth-to-space) service in the 1 427-1 429 MHz band

[Summary based on Annex [SO-EESS-1.4 GHz] of Recommendation ITU-R SM.1633.]

2/1.20/1.2.5 EESS (passive) service in the 23.6-24 GHz band and inter-satellite service in the 22.55-23.55 GHz band

2/1.20/1.2.6 EESS (passive) service in the 31.3-31.5 GHz band and fixed-satellite service (Earth-to-space) in the 30-31 GHz band

2/1.20/1.2.7 EESS (passive) service in the 50.2-50.4 GHz band and fixed-satellite service in the 47.2-50.2 GHz band

2/1.20/1.2.8 EESS (passive) service in the 50.2-50.4 GHz band and Fixed-satellite (Earth-to-space) service in the 50.4-51.4 GHz band

2/1.20/1.3 Overview and analysis of the results of studies

2/1.20/1.3.1 EESS (passive) service in the 1 400-1 427 MHz band and fixed service in the 1 350-1 400 MHz and 1 427-1 452 MHz bands

2/1.20/1.3.1.1 Power level to achieve compatibility

2/1.20/1.3.1.2 Impact on active service to meet power level

2/1.20/1.3.1.3 Impact on EESS (passive) if the power level is not met

2/1.20/1.3.2 EESS (passive) service in the 1 400-1 427 MHz band and mobile service in the 1 350-1 400 MHz and 1 427-1 452 MHz bands

2/1.20/1.3.2.1 Power level to achieve compatibility

2/1.20/1.3.2.2 Impact on active service to meet power level

2/1.20/1.3.2.3 Impact on EESS (passive) if the power level is not met

2/1.20/1.3.3 EESS (passive) service in the 1 400-1 427 MHz band and radiolocation service in the 1

350-1 400 MHz band

2/1.20/1.3.3.1 Power level to achieve compatibility

2/1.20/1.3.3.2 Impact on active service to meet power level

2/1.20/1.3.3.3 Impact on EESS (passive) if the power level is not met

2/1.20/1.3.4 EESS (passive) service in the 1 400-1 427 MHz band and space operation (Earth-to-space) service in the 1 427-1 429 MHz band

2/1.20/1.3.4.1 Power level to achieve compatibility

2/1.20/1.3.4.2 Impact on active service to meet power level

2/1.20/1.3.4.3 Impact on EESS (passive) if the power level is not met

2/1.20/1.3.5 EESS (passive) service in the 23.6-24 GHz band and inter-satellite service in the 22.55-23.55 GHz band

2/1.20/1.3.5.1 Power level to achieve compatibility

[Text based on Annex 13 of Recommendation ITU-R SM.1633 including the following]

If the unwanted emission power radiated in the passive band by one single satellite similar to HIBLEO-2 does not exceed [XX] dBW in 200 MHz, the EESS protection criterion given in Recommendation ITU-R SA.1029 would not be exceeded.

[Additional summary text needs to be included.]

2/1.20/1.3.5.2 Impact on active service to meet power level

2/1.20/1.3.5.3 Impact on EESS (passive) if the power level is not met

2/1.20/1.3.6 EESS (passive) service in the 31.3-31.5 GHz band and fixed-satellite (Earth-to-space) service in the 30-31 GHz band

2/1.20/1.3.6.1 Power level to achieve compatibility

[Text based on Annex 14 of Recommendation ITU-R SM.1633 including the following]

If the unwanted emission power radiated in the passive band by one single FSS earth station in a GSO FSS system does not exceed [XX] dBW in 200 MHz and the unwanted emission power radiated in the passive band by one single earth station in a non-GSO FSS system does not exceed [YY] dBW in 200 MHz, the EESS protection criterion given in Recommendation ITU-R SA.1029 would not be exceeded.

[Additional summary text needs to be included.]

2/1.20/1.3.6.2 Impact on active service to meet power level

2/1.20/1.3.6.3 Impact on EESS (passive) if the power level is not met

2/1.20/1.3.7 EESS (passive) service in the 50.2-50.4 GHz band and fixed-satellite service in the 47.2-50.2 GHz band

2/1.20/1.3.7.1 Power level to achieve compatibility

[Text based on Annex 19 of Recommendation ITU-R SM.1633 including the following]

If the unwanted emission power radiated in the passive band by one single FSS earth station in a GSO FSS system does not exceed [XX] dBW in 200 MHz and the unwanted emission power radiated in the passive band by one single earth station in a non-GSO FSS system does not exceed

[YY] dBW in 200 MHz, the EESS protection criterion given in Recommendation ITU-R SA.1029 would not be exceeded.

[Additional summary text needs to be included.]

2/1.20/1.3.7.2 Impact on active service to meet power level

2/1.20/1.3.7.3 Impact on EESS (passive) if the power level is not met

2/1.20/1.3.8 EESS (passive) service in the 50.2-50.4 GHz band and fixed-satellite (Earth-to-space) service in the 50.4-51.4 GHz band

2/1.20/1.3.8.1 Power level to achieve compatibility

[Text based on Annex 20 of Recommendation ITU-R SM.1633 including the following]

If the unwanted emission power radiated in the passive band by one single FSS earth station in a GSO FSS system does not exceed [XX] dBW in 200 MHz and the unwanted emission power radiated in the passive band by one single earth station in a non-GSO FSS system does not exceed [YY] dBW in 200 MHz, the EESS protection criterion given in Recommendation ITU-R SA.1029 would not be exceeded.

[Additional summary text needs to be included.]

2/1.20/1.3.8.2 Impact on active service to meet power level

2/1.20/1.3.8.3 Impact on EESS (passive) if the power level is not met

2/1.20/2 Issue (B) resolves 2

to invite ITU-R to further study the impact of implementing the values provided in considering f) and g) for unwanted emissions of fixed-service systems operating in Regions 2 and 3, taking into account that the impact on fixed-service systems in Region 1 has already been investigated

[Editor's Note: no contribution has been received to date on resolves 2 of Resolution 738.]

2/1.20/2.1 Background

2/1.20/2.2 Summary of technical and operational studies, and relevant ITU-R Recommendations

For the 2 pairs of active and passive service frequency bands listed in *considerings f) and g)* of Resolution 738 (WRC-03), studies of the required protection of the EESS (passive) allocations, as well as the impact on active services, have been documented in Recommendation ITU-R SM.1633.

In addition to Recommendation ITU-R SM.1633, other relevant Recommendations include Recommendation ITU-R SA.1029. The following sections provide summaries of studies for the band pairs considered.

[Editor's Note: These sections will summarize the EESS (passive) use of the bands, the potential impact of interference to remote sensing, the requirements for protection from unwanted emissions interference, the methodology used to determine these requirements, any qualification of the methodology used, and the impact of such requirements on the active services.]

2/1.20/2.2.1 EESS (passive) service in the 31.3-31.5 GHz band and fixed service in the 31-31.3 GHz band

2/1.20/2.2.2 EESS (passive) service in the 52.6-54.25 GHz band and fixed service in the 51.4-52.6 GHz band

2/1.20/2.3 Analysis of the results of studies

2/1.20/2.3.1 EESS (passive) service in the 31.3-31.5 GHz band and fixed service in the 31-31.3 GHz

band

2/1.20/2.3.1.1 Power level to achieve compatibility

The EESS (passive) in the band 31.3-31.5 GHz can be protected if the unwanted emissions of fixed-service systems (except high altitude platform stations (HAPS)) operating in the band 31.0-31.3 GHz do not exceed –38 dBW in a 100 MHz reference bandwidth in the band 31.3-31.5 GHz.

2/1.20/2.3.1.2 Impact on active service to meet power level (for Regions 2 and 3)

2/1.20/2.3.1.3 Impact on EESS (passive) if the power level is not met

2/1.20/2.3.2 EESS (passive) service in the 52.6-54.25 GHz band and fixed service in the 51.4-52.6 GHz band

2/1.20/2.3.2.1 Power level to achieve compatibility

The EESS (passive) in the band 52.6-54.25 GHz can be protected if the unwanted emissions of fixed-service systems operating in the band 51.4-52.6 GHz do not exceed –33 dBW in a 100 MHz reference bandwidth in the band 52.6-54.25 GHz.

2/1.20/2.3.2.2 Impact on active service to meet power level (for Regions 2 and 3)

2/1.20/2.3.2.3 Impact on EESS (passive) if the power level is not met

2/1.20/3 Methods to satisfy the agenda item

[Editor's Note: Annex 2 to Doc. 1-9/21 provides approaches that could be used in the development of additional methods.]

2/1.20/3.1 Method A

In this method, a single entry unwanted emission power [limit/level] for each corresponding active service within the EESS (passive) band taking into account the results of the compatibility analysis is proposed to be included in the Radio Regulations through a Resolution. Those [limits/levels] are non-retroactive and not to be examined by the BR and which ensure an equitable burden sharing between active and passive services.

Advantages

- The current and future passive sensors are protected.
- No need for apportionment among the active service users.
- Regulatory provisions are applied consistently worldwide.
- There is no additional burden on the Bureau.

Disadvantages

- These power limits may constrain the design and operations of future active systems.

2/1.21/3.2 Method B

[Editor's Note: Verbal proposals have been made on a further method equivalent to the result of WRC-03 conference decision on Agenda item 1.8.2 without any reference to any footnote of the Radio Regulation containing a Resolution. Contributions on this matter are expected at the next TG 1/9 meeting.]

2/1.20/4 Regulatory and procedural considerations

[Editor's Note: For each band pair in accordance with Resolution 738, one of the following methods may be chosen so as to create a mixture of different methods to solve the agenda item.]

2/1.20/4.1 Method A

Unwanted emission power [limits/levels] within the passive bands as well as regulatory conditions (such as non-retroactivity, non-examination by the BR) would be included in a Resolution. A footnote in Article 5 similar to No. 5. 347A would direct towards this Resolution. Those [limits/levels] should ensure an equitable burden sharing for achieving compatibility between active and passive services.

[Editor's Note: particular attention should be paid to the application of the non-retroactivity for the different kind of radiocommunication services involved.]

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item 1.21: "to consider the results of studies regarding the compatibility between the radio astronomy service and the active space services in accordance with Resolution 740 (Rev.WRC-03), in order to review and update, if appropriate, the tables of threshold levels used for consultation that appear in the Annex to Resolution 739 (WRC-03)"

ISSUE:

Unwanted emissions produced by stations of the active space services causing unacceptable interference to stations of the radio astronomy service, RAS. Ensuring equitable sharing of burden for achieving compatibility between the active space services and the RAS.

Measures beyond the general unwanted emission limits in Appendix 3 required to protect the RAS from unwanted emissions of active space services for the band-pairs listed in the Table,

TABLE

Band-pairs to be considered for further studies

Space service band	Space service	Radio astronomy service band
(MHz)		(MHz)
137-138	MSS (space-to-Earth)	150.05-153.0 (No. 5.208A)
387-390	MSS (space-to-Earth)	322-328.6 (No. 5.208A)
400.15-401	MSS (space-to-Earth)	406.1-410 (No. 5.208A)
620-790 (No. 5.311) see Resolution 545 (WRC-03)	BSS (space-to-Earth)	608-614
1452-1492	BSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1525-1559	MSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1525-1559	MSS (space-to-Earth) (non-GSO systems only)	1610.6-1613.8
1559-1610	RNSS (space-to-Earth)	1610.6-1613.8
2655-2670	BSS (space-to-Earth)	2 690-2700
2655-2670	FSS (space-to-Earth) (Region 2)	2 690-2700
2670-2690	FSS (space-to-Earth) (Region 2)	2 690-2700
(GHz)		(GHz)
10.7-10.95	FSS (space-to-Earth)	10.6-10.7
21.4-22.0	BSS (space-to-Earth)	22.21-22.5

BACKGROUND:

Resolution 740 (WRC-03) Future compatibility analyses between the radio astronomy service and active space services in certain adjacent and nearby frequency bands

Resolution 739 (WRC-03) Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands (Annex 1 Unwanted emission threshold levels)

Recommendation ITU-R M.1583 provides a methodology based on the equivalent power flux-density (epfd) concept for calculation of interference resulting from unwanted emissions from non-geostationary (non-GSO) satellite systems of the MSS or RNSS into radio astronomy stations;

Recommendation ITU-R S.1586 provides a methodology based on the epfd concept for calculation of interference resulting from unwanted emissions from non-GSO systems of the FSS into radio astronomy stations;

MALAYSIA's PRELIMINARY VIEW (1.21):

In developing the compatibility criteria between radioastronomy service and active space services, the realistic and technically based approaches on the limitations of unwanted emissions of active services should be taken into account.

The compatibility criteria between active services and the radioastronomy service shall also include the appropriate mitigation techniques at the radioastronomy stations.

In considering this item no additional constrains shall apply to the characteristics of the existing satellite systems

Malaysia is agreeable that in cases where difficulties are encountered in meeting the agreed values in the Annex, a consultation procedure could be used to resolve the difficulties.

Annex 13 to TG 1/9 Chairman's Report (29 Sept 2005)

**WORKING DOCUMENT TOWARD DRAFT CPM TEXT
FOR WRC-07 AGENDA ITEM 1.21**

Agenda item 1.21 (TG 1/9 / 4A, 6S, 7D, 8D)

to consider the results of studies regarding the compatibility between the radio astronomy service and the active space services in accordance with Resolution 740 (WRC-03), in order to review and update, if appropriate, the tables of threshold levels used for consultation that appear in the Annex to Resolution 739 (WRC-03).

Resolution 740 (WRC-03)

Future compatibility analyses between the radio astronomy service and active space services in certain adjacent and nearby frequency bands.

Resolution 739 (WRC-03)

Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands.

Annex 1 to Resolution 739

Tables of pfd thresholds for unwanted emissions from GSO space stations at a RAS station.

2/1.21/1 Issue (A) resolves 1 of Resolution 740 (WRC-03)

to invite ITU-R to study the compatibility between the RAS and the corresponding active space services as listed in the Table only, with a view to updating or developing ITU-R Recommendations, if appropriate.

The Table from Resolution 740 and, Tables 1-1 and 1-2 from Resolution 739 are reproduced below. In the following tables the space services are considered are active space services

Resolution 740 (WRC-03)

TABLE

Band-pairs to be considered for further studies

Space service band MHz	Space service	Radio astronomy service band MHz
137-138	MSS (space-to-Earth)	150.05-153.0 (No. 5.208A)
387-390	MSS (space-to-Earth)	322-328.6 (No. 5.208A)
400.15-401	MSS (space-to-Earth)	406.1-410 (No. 5.208A)
620-790 (No. 5.311) see Resolution 545 (WRC-03)	BSS (space-to-Earth)	608-614
1 452-1 492	BSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1 525-1 559	MSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1 525-1 559	MSS (space-to-Earth) (non-GSO systems only)	1 610.6-1 613.8
1 559-1 610	RNSS (space-to-Earth)	1 610.6-1 613.8
2 655-2 670	BSS (space-to-Earth)	2 690-2 700
2 655-2 670	FSS (space-to-Earth) (Region 2)	2 690-2 700
2 670-2 690	FSS (space-to-Earth) (Region 2)	2 690-2 700
GHz		GHz
10.7-10.95	FSS (space-to-Earth)	10.6-10.7
21.4-22.0	BSS (space-to-Earth)	22.21-22.5

Resolution 739 (WRC-03)

Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands

TABLE 1-1

Pfd thresholds for unwanted emissions from geostationary space stations at a radio astronomy station

Space service	Space service band	Radio astronomy band	Single dish, continuum observations		Single dish, spectral line observations		VLBI ⁽¹⁾
			pfd ⁽²⁾	Reference bandwidth	pfd ⁽²⁾	Reference bandwidth	pfd ⁽²⁾
	MHz	MHz	dB(W/m ²)	MHz	dB(W/m ²)	kHz	dB(W/m ²)
BSS (s-to-E)	1 452-1 492	1 400-1 427	-180	27	-196	20	-166
MSS (s-to-E)	1 525-1 559						
MSS (s-to-E)	1 525-1 559	1 610.6-1 613.8	NA	NA	-194	20	-166
MSS (s-to-E)	1 613.8-1 626.5						
BSS (s-to-E)	2 655-2 670	2 690-2 700	-177	10	NR	25	-161
FSS (s-to-E)	2 670-2 690	2 690-2 700 (in Regions 1 and 3)	-177	10	NR	20	-161
	GHz	GHz	-	-	-	-	-
BSS (s-to-E)	21.4-22.0	22.21-22.5	NR	NR	NR	250	-128

NA: Not applicable, measurements of this type are not made in this band.

NR: No result available.

⁽¹⁾ The reference bandwidth used for spectral line observations has also been used as reference bandwidth for very long baseline interferometry (VLBI) observations. In VLBI bands, where no spectral line observations are conducted, the reference bandwidth for VLBI observations has been determined using the assumption of Recommendation ITU-R RA.769 for a typical spectrometer channel (3 km/s).

⁽²⁾ Integrated over the reference bandwidth with an integration time of 2 000 s.

TABLE 1-2

**Epfd thresholds⁽¹⁾ for unwanted emissions from non-GSO
satellite systems at a radio astronomy station**

Space service	Space service band	Radio astronomy band	Single dish, continuum observations		Single dish, spectral line observations		VLBI ⁽²⁾
			epfd ⁽³⁾	Reference bandwidth	epfd ⁽³⁾	Reference bandwidth	epfd ⁽³⁾
	MHz	MHz	dB(W/m ²)	MHz	dB(W/m ²)	kHz	dB(W/m ²)
MSS (s-to-E)	1 613.8-1 626.5	1 610.6-1 613.8	NA	NA	-258	20	-230

NA: Not applicable, measurements of this type are not made in this band.

- ⁽¹⁾ These epfd thresholds should not be exceeded for more than 2% of time.
- ⁽²⁾ The reference bandwidth used for spectral line observations has also been used as reference bandwidth for VLBI observations. In VLBI bands, where no spectral line observations are conducted, the reference bandwidth for VLBI observations has been determined using the assumption of Recommendation ITU-R RA.769 for a typical spectrometer channel (3 km/s).
- ⁽³⁾ Integrated over the reference bandwidth with an integration time of 2 000 s.

2/1.21/1.1 Background

In preparation for WRC-03, Task Group 1/7 conducted studies that led to the adoption of Recommendation ITU-R SM.1633, which contains nine Annexes that, using the methodology contained in the Recommendation, assess the compatibility of various band pairs between the radio astronomy service and space services. Not all studies in the Annexes are complete. On the basis of Recommendation ITU-R SM.1633 and associated studies, WRC-03 adopted Resolutions 739 and 740.

Resolution 739 contains guidance to administrations operating space and radio astronomy stations in the band pairs contained in Tables 1-1 and 1-2, in order to come to acceptable solutions regarding space station unwanted emissions at a radio astronomy station. The Resolution includes a consultation process adopted at WRC-03 to assist administrations in reaching mutually acceptable solutions when unwanted emissions from space services exceed specified levels in certain radio astronomy bands. The consultation process is included in Resolution 739 and will not be considered at WRC-07.

Resolution 740 calls for the completion of studies for the band pairs indicated in its associated band-pair Table. Comprehensive studies are needed to determine whether any of the band pairs from the Table of Resolution 740 should be added to the tables in Resolution 739, and, if so, to determine the impact on all the concerned active and passive services and the appropriate threshold levels for consultation.

The scope of agenda item 1.21 is limited to consideration of the band pairs in the Table of Resolution 740 (and the associated threshold levels for consultation) only, for the purpose of making appropriate additions from this table to the existing tables in Resolution 739.

In the opinion of ICAO, the frequency band 1 559-1 610 MHz "is the main allocation available for GNSS" and in accordance to the official policies of ICAO there is "no change to the use of this band for future GNSS elements, including GLONASS and GPS" (ICAO Doc. 9718-AN/957, 2003).

In order to improve the interference situation in the frequency band 1 610.6-1 613.8 MHz, an agreement was concluded between the satellite operator GLONASS and the Inter-Union Commission on Frequency Allocations for Radio Astronomy and Space Science (IUCAF),

[editor's note : clarification should be made about agreement outside of the ITU circle] representing

the radio astronomy community worldwide (Document WRC-93/43). This agreement contains a phased approach to meet the protection criteria of the RAS after some years. Subject to the above agreement the channel plan has been revised and satellite transmissions switched over to frequencies further below the 1 610.6-1 613.8 MHz band, also new satellites of the system were equipped with additional filters reducing the level of unwanted emissions per satellite down to the threshold levels given in Recommendation ITU-R RA.769. This provides some balance between the interests of both RNSS and RAS through the agreement existing in the bands 1 559-1 610 MHz/1 610.6-1 613.8 MHz.

In the case where a consultation process with more stringent limitation will be implemented, the above-mentioned balance of interests would not be preserved since at least one existing RNSS system is currently not able to comply with such RAS protection criteria in the band 1 610.6-1 613.8 MHz and therefore equal access of all RNSS systems to the band 1 559-1 610 MHz will not be provided.

2/1.21/1.2 Summary of technical and operational studies, and relevant ITU-R Recommendations

For the pairs of active and passive service frequency bands listed in the Table in Resolution 739 (WRC-03), studies of the required protection of the radio astronomy allocation, as well as the impact on active services, have been documented in Recommendation ITU-R SM.1633.

In addition to Recommendation ITU-R SM.1633, other relevant Recommendations include RA.769 and RA 1513. The following sections will provide summaries of studies for the band pairs considered in Table 1 of Resolution 740.

2/1.21/1.3 Analysis of the results of studies

To date compatibility studies have been carried out for the following band pairs:

Space service band MHz	Space service	Radio astronomy service band MHz
137-138	MSS (space-to-Earth)	150.05-153.0
387-390	MSS (space-to-Earth)	322-328.6
400.15-401	MSS (space-to-Earth)	406.1-410
620-790	BSS (space-to-Earth)	608-614
1 525-1 559	MSS (space-to-Earth) (non-GSO systems only)	1 400-1 427
1 525-1 559	MSS (space-to-Earth) (non-GSO systems only)	1 610.6-1 613.8
1 559-1 610	RNSS (space-to-Earth)	1 610.6-1 613.8

Studies are also required for the following band pairs:

- 1 452-1 492 MHz/1 400-1 427 MHz BSS(NGSO)/RAS
- 2 655-2 670 MHz/2 690-2 700 MHz FSS/RAS
- 2 655-2 670 MHz/2 690-2 700 MHz BSS/RAS
- 2 670-2 690 MHz/2 690-2 700 MHz FSS/RAS
- 10.7-10.95 GHz/10.6-10.7 GHz FSS/RAS
- 21.4-22.0 GHz/22.21-22.5 GHz BSS/RAS

Studies of the MSS (space -to-Earth)/RAS band pair 137-138 MHz/150.05-153 MHz

For the case of non-GSO constellations, an epdf threshold level of -238 (dBW/m²) may be derived for the band 150.05-153 MHz from the RAS unwanted emission threshold criterion given in Recommendation ITU-R RA.769 for this band and the maximum radio astronomy antenna gain given in Recommendation ITU-R RA.1631, which is 44 dBi for this frequency band.

Studies have been performed taking into account the MSS characteristics given in Recommendation ITU-R M.1184 and the methodology in Recommendation ITU-R M.1583. The conclusions are that, depending on the MSS constellation, this epdf level corresponds to a pfd level per satellite from -216 to -193 dBW/m² in the whole band 150.05-153 MHz.

The unwanted emissions of MSS non-GSO satellites using the band 137-138 MHz falling into the RAS band 150.05-153 MHz fall in the spurious domain. The calculation of the total amount of spurious emissions in the RAS band when considering a constant level calculated using Appendix 3 shows a discrepancy of 53 to 77 dB. This hypothesis is very stringent and clearly not realistic, as spurious emissions generally appear at some discrete frequencies. Therefore, further work is needed taking into account discrete component of spurious emissions, in order to get more realistic MSS unwanted emission levels in the RAS band.

It is necessary to continue studies to identify the possibility of implementation of obtained limits for MSS systems.

Studies of the MSS (space -to-Earth)/RAS band pair 387-390 MHz/322-328.6 MHz

For the case of non-GSO constellations, an epdf threshold level of -240 (dBW/m²) may be derived for the band 322-328.6 MHz from the RAS unwanted emission threshold criterion given in Recommendation ITU-R RA.769 for this band and the maximum radio astronomy antenna gain given in Recommendation ITU-R RA.1631, which is 51 dBi for this frequency band.

Studies have been performed taking into account the characteristics of one non-GSO MSS system and the methodology in Recommendation ITU-R M.1583. Analysis of the calculation results shows that there is more than 18 dB of positive margin between the actual pfd radiated by this system in the RAS band and the pfd per satellite of -198 dBW/m² determined using Rec.ITU-R M.1583.

It is necessary to continue studies to identify the possibility of implementation of obtained limits for other MSS systems.

Studies of the MSS (space -to-Earth)/RAS band pair 400.15-401 MHz/406.1 -410 MHz

For the case of non-GSO constellations, an epdf threshold of -242 (dBW/m²) may be derived for the band 406.1-410 MHz from the RAS unwanted emission threshold criterion given in Recommendation ITU-R RA.769 for this band and the maximum antenna gain given in Recommendation ITU-R RA.1631, which is 53 dBi for this frequency band.

Studies have been performed taking into account the MSS characteristics given in Recommendation ITU-R M.1184 and the methodology in Recommendation ITU-R M.1583.

The conclusions are that, this epdf level corresponds to a pfd level per satellite from -197 to -185 dBW/m² in the whole band 406.1-410 MHz, depending on the MSS constellation. The unwanted emissions of MSS non-GSO satellites using the band 400.15-401 MHz falling into the RAS band 406.1-410 MHz fall in the spurious domain. The calculation of the total amount of spurious emissions in the RAS band when considering a constant level calculated using Appendix 3 shows a discrepancy of 54 to 59 dB. This hypothesis is very stringent and clearly not realistic, as spurious emissions generally appear at some discrete frequencies. Therefore, further work is needed taking into account discrete component of spurious emissions, in order to get more realistic MSS unwanted emission levels in the RAS band.

It is necessary to continue studies to identify the possibility of implementation of obtained limits for MSS systems.

Studies of the BSS/RAS band pair 620-790 MHz/608-614 MHz

Resolution 545 (WRC-03) invited the ITU-R to conduct studies, as a matter of urgency, to develop sharing criteria and regulatory provisions, prior to WRC-07, for the protection of terrestrial services in the 620-790 MHz band from GSO BSS networks and non-GSO BSS satellite networks planned to operate in this band. While the 608-614 MHz radio astronomy band is outside the band in which GSO or non-GSO satellite networks plan to operate, astronomical observations in this band may be heavily impacted by unwanted emissions from the networks, and compatibility studies are conducted between the services within the framework of Resolution 545.

For the case of non-GSO constellations, an efpd threshold level of -241 (dBW/m²·6 MHz) may be derived for the band 608-614 MHz from the RAS unwanted emission threshold criterion given in Recommendation ITU-R RA.769 for this band and the maximum radio astronomy antenna gain given in Recommendation ITU-R RA.1631, which is 56 dBi for this frequency band.

A study has been performed taking into account the characteristics of an HEO system that may use the BSS allocation in the band 620-790 MHz, and the methodology in Recommendation ITU-R M.1583. The conclusions are that, this efpd level corresponds to a pfd level per satellite of -188 dBW/m² in the whole band 608-614 MHz. There are at present no networks operating in the 620-790 MHz band, and it is not known if the unwanted emissions of planned system will meet the above levels.

It is necessary to continue studies to identify the possibility of implementation of obtained limits for BSS systems.

Studies of the BSS(NGSO)/RAS band pair 1 452-1 492 MHz/1 400-1 427 MHz

[TBD]

Studies of the MSS/RAS band pair 1 525-1 559 MHz/1 400-1 427 MHz

Studies carried out in TG 1-9 to assess the levels of out-of-band emission radiated by non-GSO MSS systems into the RAS band show that an efpd level of -243 dBW/m² in the full 1 400-1 427 MHz band, and an efpd level of -259 dBW/m² in any 20 kHz portion of the band would satisfy for these systems the RAS unwanted emission threshold criteria given in Recommendation ITU-R RA.769 for this band. For the non-GSO MSS systems that plan to operate in the band, this translates into an unwanted emission level of less than -190 dBW/m² in the entire 1 400-1 427 MHz band and less than -206 dBW/m² per satellite in any 20 kHz portion of the band. At present no NGSO MSS system is operational in the band. Preliminary calculations, based on spurious emission levels radiated into the radio astronomy band show the unwanted threshold level to be exceeded by a large margin, but further studies are needed.

Editor's note: Special emphasis should be given to studying the potential implementation of requirements on RAS protection against safety systems of COSPAS-SARSAT type operating in 1 544-1 545 MHz band.

Studies of the MSS/RAS band pair 1 525-1 559 MHz/1 610.6-1 613.8 MHz

Studies carried out in ITU-R to assess the levels of out-of-band emission radiated by non-GSO MSS systems into the RAS band show that an efpd level of -258 dBW/m² in any 20 kHz segment of the 1 610.6-1 613.8 MHz band would satisfy for these systems the RAS unwanted emission threshold criteria given in Recommendation ITU-R RA.769 for this band. For the non-GSO MSS system that plans to operate in the band, this translates into an unwanted emission level of -205 dBW/m² per satellite, in any 20 kHz portion of the band. At present no non-GSO MSS system is operational in the

band. Preliminary calculations, based on spurious emission levels radiated into the radio astronomy band show that the unwanted emission level may be exceeded by a large margin, but further studies are needed, due to the simplifying assumptions employed in the calculation.

Editor's note: Special emphasis should be given to studying the potential implementation of requirements on RAS protection against safety systems of COSPAS-SARSAT type operating in 1 544-1 545 MHz band.

Studies of the RNSS/RAS band pair 1 559-1 610 MHz/1 610.6-1 613.8 MHz

Studies were carried out in ITU-R to assess the levels of out-of-band emission radiated by non-Geostationary RNSS systems into the RAS band. An efd level of $-258 \text{ dBW/m}^2 \cdot 20 \text{ kHz}$ was found to satisfy for these systems the unwanted emission threshold criterion for the RAS, given in Recommendation ITU-R RA.769 for this band. For the systems considered, this translates into an unwanted emission level of $-212 \text{ dBW/m}^2 \cdot 20 \text{ kHz}$ per satellite. One of the systems that is currently operational already complies with this level, another planned system is expected to comply with the same level. Another existing system exceeds this level with more than 20 dB.

For the HEO RNSS system considered within ITU-R, the efd level to satisfy RAS unwanted emission threshold criterion given in Recommendation ITU-R RA.769 for this band can be translated into an unwanted emission level of $-203 \text{ dBW/m}^2 \cdot 20 \text{ kHz}$ per satellite. One planned HEO RNSS system is expected to comply with this level.

Studies of the BSS/RAS band pair 2 655-2 670 MHz/2 690-2 700 MHz

[TBD]

Studies of the FSS/RAS band pair 2 655-2 670 MHz/2 690-2 700 MHz

[TBD]

Studies of the FSS/RAS band pair 2 670-2 690 MHz/2 690-2 700 MHz

[TBD]

Studies of the FSS/RAS band pair 10.7-10.95 GHz/10.6-10.7 GHz

[TBD]

Studies of the BSS/RAS band pair 21.4-22.0 GHz/22.21-22.5 GHz

[TBD]

2/1.21/1.4 Methods to satisfy the agenda item

Method 1

Add the threshold levels for those bands for which studies have been concluded to Tables 1-1 and 1-2 of Resolution 739 and modify the resolves so that the date of application of Resolution 739 for these new pairs of bands is set at the entry in force of the Final Acts of WRC-07. Remove those bands from the table of band pairs to be considered for future studies in Resolution 740.

Advantages

- This would ensure that the notifying administration for a satellite system using the band identified in section 2/1.21/1.3 being unable to meet the threshold level consult the administration using radioastronomy stations in the RAS bands identified in section 2/1.21/1.3 at an early stage.
- May avoid interference to the RAS from satellite networks for which advance publication information is received by the BR after the entry in force of the WRC-07 Final Acts.

Disadvantages

- The application of the consultation process identified in Resolution 739 may add some burden on administrations.
- The consultation process may lead to technical constraints difficult to implement by some systems.

Method 2

This method is similar to Method 1, with the exception that the applicability of Tables 1-1 and 1-2 of Resolution 739 is not extended to cover RNSS for the band pair 1 559-1 610 MHz/1 610.6-1 613.8 MHz.

Advantages

- No additional burden on administrations and no additional constraint on RNSS for the band pair 1 559-1 610 MHz/1 610.6-1 613.8 MHz.
- [Contributes to equal access of all RNSS systems to the band 1 559-1 610 MHz, since at least one existing RNSS system is currently not able to comply with RAS protection criteria in the band 1 610.6-1 613.8 MHz.]

Disadvantages

- The absence of consultation process between RNSS and RAS may prevent the RAS band 1 610.6-1 613.8 MHz to be protected from interference from future RNSS systems and in this case would preclude the usage of this band by RAS for the observation of the hydroxyl radical spectral line in the future.

Method 3

No incorporation of any of the threshold levels studied into Table 1-2 of Resolution 739.

Advantages

- TBD

Disadvantages

- TBD

2/1.21/1.5 Regulatory and procedural considerations

Considerations related to implementation of each of the above methods

WP 3

*(Fixed Satellite, Mobile Satellite and
Broadcasting Satellite below 3GHz.)*

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WRC Agenda Items: 1.7, 1.9, 1.11, 1.17

Malaysia

PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item Agenda Item 1.7

WRC-2007 Agenda Item 1.7: “to consider the results of ITU-R studies regarding sharing between the mobile-satellite service and the space research service (passive) in the band 1 668-1 668.4 MHz, and between the mobile-satellite service and the mobile service in the band 1 668.4-1 675 MHz in accordance with Resolution **744 (WRC-03)**;”

ISSUE: Resolution **744 (WRC-03)**, deals with sharing between the mobile satellite service (MSS) (Earth-to-space) and the space-research (passive) service in the band 1 668 – 1 668.4 MHz and between the MSS (Earth-to-space) and the fixed and mobile services in the band 1 668.4 – 1 675 MHz.

BACKGROUND: At WRC-03, a new global allocation was made to the MSS (Earth-to-space) in the band 1 668 – 1 675 MHz and a global allocation to the MSS (space-to-Earth) in the band 1 518 - 1 525 MHz. MSS interests provided support for this agenda item. In Malaysia, the band 1 668 – 1 668.4 MHz is allocated to the space research (passive) and radio astronomy services (RAS) and the band 1 668.4-1 670 MHz is allocated to meteorological aids (MetAids) (radiosonde) and radio astronomy, both on a primary basis. The band 1 670 - 1 675 MHz is also currently planned for use in Malaysia for the fixed and mobile services. In accordance with the Resolution **744**, the stations in the MSS shall not claim protection from fixed and mobile stations operating within Malaysia.

Frequency Band (MHz)	ITU Allocation		
	Region1	Region2	Region 3
1660.5-1668.4	RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379 5.379A		
1668.4-1670	METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149 5.341		

Frequency Band (MHz)	ITU Allocation		
	Region1	Region2	Region 3
1668.4-1670	METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149 5.341		
1670-1675	METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE 5.380 5.341		

ALLOCATION FOR MALAYSIA

1660.5-1668.4	RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.341 5.379A MLA19	MLA19 The band between 1660.5MHz to 1690MHz is restricted for the use to the Government of Malaysia, may be permitted for the fixed and mobile except aeronautical mobile services. Sharing between Fixed and Mobile Services.
1668.4-1670	METEOROLOGICAL AIDS FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149 5.341 MLA19	MLA19: The band between 1660.5MHz to 1690MHz is restricted for the use to the Government of Malaysia, may be permitted for the fixed and mobile except aeronautical mobile services. Meteorological Aids Utilisation.
1670-1675	METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE 5.380 5.341 MLA19	MLA19: The band between 1660.5MHz to 1690MHz is restricted for the use to the Government of Malaysia, may be permitted for the fixed and mobile except aeronautical mobile services.

MALAYSIA'S PRELIMINARY VIEW (1.7):

1. Malaysia supports the completion of studies demonstrating how: a) Radio astronomy and Space Research (passive) services, and b) Radio astronomy stations and MetAids earth stations can be protected from interference from mobile earth stations, in the bands 1 668 – 1 668.4 MHz and 1 668.4-1 670 MHz, respectively. Preliminary studies within the ITU-R show that co-frequency sharing between RAS stations and mobile earth stations (MES) is feasible, e.g. by employing coordination zones of radii of the order of 300 km, under worst case scenarios. To date, these studies considered only terrestrial MES; the airborne case was not considered. Interference by MES operating in the 1 670-1 675 MHz band can be prevented by much smaller coordination radii, of the order of 50 km.

2. Malaysia supports the completion of sharing studies between the mobile service and MSS in the band 1 668.4 – 1 675 MHz, recognizing that stations in the MSS shall not claim protection from fixed and mobile stations operating in **Malaysia**, as stated in the *resolves* of Resolution **744**. These studies need to identify solutions so that the implementation of MSS networks in this band would not constrain the development of new/advanced applications in the mobile service that may be more susceptible to interference. (November 2004)

Malaysia
PRELIMINARY VIEWS ON WRC-07
WRC-2007 Agenda Item Agenda Item 1.9

WRC-2007 Agenda Item:

Agenda Item 1.9: to review the technical, operational and regulatory provisions applicable to the use of the band 2 500-2 690 MHz by space services in order to facilitate sharing with current and future terrestrial services without placing undue constraint on the services to which the band is allocated;

ISSUE: Technical, operational and regulatory provisions applicable to the use of the band 2 500-2 690 MHz by space services in order to facilitate protection of the terrestrial services in the band.

BACKGROUND: The band 2 500-2 690 MHz is allocated to terrestrial and satellite services. The terrestrial services allocations include Mobile and Fixed services (including IMT-2000). Both services have been rapidly evolving to encompass high speed mobile internet access requiring sensitive receiving equipment some of which are highly susceptible to interference.

The satellite services in the band include MSS, BSS (including GSO and non-GSO), and FSS. At WRC-03, the issue of sharing between terrestrial services and NGSO BSS(Sound) in certain Region 3 countries was resolved with the revision of pfd limits for NGSO BSS(Sound) per Resolution **539**. GSO BSS(Sound) limits within these countries were also adjusted for systems for which complete Appendix 4 coordination information has been received after 1 June 2005. Other than for these Region 3 countries, the BSS limits remained unchanged as specified in Table 21-4 of the Radio Regulations.

WRC-03 recognized that there may be a need to revise technical, operational and regulatory provisions applicable to the space services in the band to accommodate the implementation of new innovative technologies in the Fixed and Mobile services. To that end, WRC-03 developed and included this issue for consideration by WRC-07 (see Agenda Item 1.9).

In general, co-frequency sharing between the MSS and terrestrial services has been found to be difficult in the ITU-R studies. The sharing between the terrestrial services and the MSS poses risks of harmful interference to both systems. In addition, it requires large separation distance between terrestrial stations and MSS earth terminals in order to avoid harmful interference to both stations. Recommendation M.2041 studied the feasibility of sharing between MSS and MS for IMT-2000 and highlighted the incompatibility between these two services on a co-frequency basis.

Both BSS and FSS are also allocated to the 2 500-2 690 MHz band and are subject to the limits in Table 21-4. Within Region 3 any satellite service launched may overlap many other Region 2 countries and have the effect of interfering with existing and planned terrestrial services within that band.

Administrations in Region 3 are planning for implementation of combination of terrestrial services, broadcasting satellite service in the 2500-2690 MHz band. To add Mobile

satellite service will cause uphill battle to coordinate the services. In Malaysia there are no allocations to space services in this band.

Frequency Band (MHz)	ITU Allocation		
	Region1	Region2	Region 3
2500-2520	FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE 5.351A (space-to-earth) 5.403 5.405 5.407 5.412 5.414	FIXED 5.409 5.411 FIXED SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (space-to-earth) 5.403 5.351A 5.404 5.407 5.414 5.415A	
2520-2535	FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416	FIXED 5.409 5.411 FIXED SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.403 5.418B 5.418C	FIXED 5.409 5.411 FIXED SATELLITE (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.403 5.415A
2535-2655	5.339 5.403 5.405 5.412 5.418 5.418B 5.418C		FIXED 5.409 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 5.339 5.418 5.418A 5.418B 5.418C

2655-2670	FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A BROADCASTING SATELLITE 5.413 5.416 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 5.149 5.412 5.420	FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 5.149 5.420	FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A BROADCASTING-SATELLITE 5.413 5.416 Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 5.149 5.420
2670-2690	FIXED 5.409 5.410 5.411 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 5.149 5.419 5.420	FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 5.149 5.419 5.420	FIXED 5.409 5.411 FIXED-SATELLITE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A Earth Exploration-Satellite (passive) Radio Astronomy Space Research (passive) 5.149 5.419 5.420 5.420A

ALLOCATION TO MALAYSIA

<p>2500-2520</p>	<p>FIXED 5.409 5.411 MLA38</p> <p>FIXED SATELLITE (space-to-Earth) 5.415 MLA34</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>MOBILE-SATELLITE (space-to-earth) 5.351A 5.403 MLA34</p> <p>5.404 5.407 5.414 5.415A</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in the Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>MLA38: The frequency band 2504 – 2688 MHz is planned for IMT 2000 extension band</p> <p>SRSP Ref: 523</p>
<p>2520-2535</p>	<p>FIXED 5.409 5.411 MLA38</p> <p>FIXED SATELLITE (space-to-Earth) 5.415</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING-SATELLITE 5.413 5.416</p> <p>5.403 5.415A</p>	<p>MLA38: The frequency band 2504 – 2688 MHz is planned for IMT 2000 extension band</p> <p>SRSP Ref: 523</p>
<p>2535-2655</p>	<p>FIXED 5.409 5.411 MLA38</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING SATELLITE 5.413 5.416 MLA34</p> <p>5.339 5.418 5.418A 5.418B 5.418C</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>MLA38: The frequency band 2504 – 2688 MHz is planned for IMT 2000 extension band</p> <p>SRSP Ref: 523</p>
<p>2655-2670</p>	<p>FIXED 5.409 5.411 MLA38</p> <p>FIXED-SATELLITE (Earth-to-space) 5.415</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>BROADCASTING- SATELLITE 5.413 5.416</p> <p>Earth Exploration-Satellite (passive)</p> <p>Radio Astronomy</p> <p>Space Research (passive)</p> <p>5.149 5.420</p>	<p>MLA38: The frequency band 2504 – 2688 MHz is planned for IMT 2000 extension band</p> <p>SRSP Ref: 523</p>

2670-2690	<p>FIXED 5.409 5.411 MLA38</p> <p>FIXED-SATELLITE (Earth-to-space) 5.415 MLA34</p> <p>MOBILE except aeronautical mobile 5.384A</p> <p>MOBILE-SATELLITE (Earth-to-space) 5.351A MLA34</p> <p>Earth Exploration-Satellite (passive)</p> <p>Radio Astronomy</p> <p>Space Research (passive)</p> <p>5.149 5.419 5.420</p>	<p>MLA38: The frequency band 2504 – 2688 MHz is planned for IMT 2000 extension band</p> <p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>SRSP Ref: 523</p>
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MALAYSIA'S PRELIMINARY VIEW (1.9):

1. Malaysia is of the view that the scope of this agenda item is restricted to consideration of technical, operational and regulatory provisions applicable to the use of the band 2 500-2 690 MHz by space services in order to facilitate protection of the terrestrial services in the band.
2. Malaysia supports the ongoing studies being conducted at ITU-R with the view to establishing necessary regulatory protection for the terrestrial services in the 2500-2690 MHz band.
3. Malaysia supports NOC to RR footnotes **5.417A** and **5.418** as adopted by WRC-03 relating to non-GSO and GSO BSS (sound) systems in the band 2 605-2 655 MHz. (November 2004)

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item: Agenda Item 1.11

WRC-2007 Agenda Item:

Agenda Item 1.11: to review sharing criteria and regulatory provisions for protection of terrestrial services, in particular terrestrial television broadcasting services, in the band 620-790 MHz from BSS networks and systems, in accordance with Resolution **545 (WRC-03)**;

ISSUE: Resolution **545 (WRC-03)** invite ITU-R to conduct studies as a matter of urgency, and develop sharing criteria and regulatory provisions, prior to WRC-07, for protection of terrestrial services, in particular terrestrial television broadcasting services, in the 620-790 MHz from GSO BSS and non-GSO BSS satellite networks or systems which it is planned to operate in this band.

BACKGROUND: 5.311 provide the conditions under which the band 620-790 MHz maybe used for assignments to television stations using frequency modulation in the broadcasting satellite services.

It is necessary to adequately protect terrestrial services including the terrestrial television broadcasting systems in this band.

Frequency Band (MHz)	ITU Allocation		
	Region1	Region2	Region 3
470-512	BROADCASTING 5.149 5.294 5.296 5.300 5.302 5.304 5.306 5.311 5.312 5.291A	BROADCASTING Fixed Mobile 5.292 5.293	FIXED MOBILE BROADCASTING
512-585		BROADCASTING	5.291 5.298
585-608		5.297	FIXED
608-610		RADIO ASTRONOMY Mobile-Satellite except aeronautical mobile-satellite (Earth-to-space)	MOBILE BROADCASTING RADIONAVIGATION
610-614			5.149 5.305 5.306 5.307 FIXED MOBILE 5.317A BROADCASTING 5.149 5.305 5.306 5.307 5.311 5.320

The GSO BSS networks and non-GSO BSS satellite networks or systems are at the stage of advanced publication or coordination, or have been notified in the 620-790 MHz frequency band.

Malaysia uses the entire 510-790 MHz for broadcasting (either analog tv or digital tv).

Frequency Band (MHz)	Malaysian Allocation	Notes/Future use
614-806	FIXED MOBILE BROADCASTING MLA32 5.149 5.311 5.317A	MLA32: The frequency band 510 - 798 MHz is planned for Digital Terrestrial Television Broadcasting (DTTB) service. All Analogue Terrestrial Broadcasting Services to be phased out by 2015. The band from 798 – 806 MHz for mobile use SRSP Ref: 521

MALAYSIA PRELIMINARY VIEW (1.11):

Malaysia would like to see the outcome of ITU-R study before making further comment.

Malaysia
PRELIMINARY VIEWS ON WRC-07
Agenda Item 1.17

WRC-2007 Agenda Item:

Agenda Item 1.17: to consider the results of ITU-R studies on compatibility between the fixed-satellite service and other services around 1.4 GHz, in accordance with Resolution **745 (WRC-03)**;

ISSUE: Resolution 745 (WRC-03), deals with the protection of existing services in all Regions from non-geostationary-satellite feeder links for mobile-satellite service links below 1 GHz operating in the fixed-satellite service and using the frequency bands around 1.4 GHz on a secondary basis.

BACKGROUND: At WRC-03, the Conference decided to make the bands 1 390-1 392 MHz and 1 430-1 432 MHz available for the fixed-satellite service (FSS) on a secondary basis for feeder links in the (Earth-to space) and (Space to Earth) directions, respectively, for non-GSO satellite systems in the MSS with service links operating below 1 GHz, and subject to Resolution 745 as follows:

- 1 That the additional allocations for the FSS on a secondary basis in the bands 1 390- 1 392 MHz and 1 430- 1 432 MHz for feeder links in the (Earth to space) and (Space to Earth) directions, respectively, for non GSO satellite systems in the MSS with service links operating below 1 GHz, shall not be used until the Completion of ITU-R studies on all identified compatibility issues as shown in Annex 1 to this Resolution and the results of these studies shall be reported to WRC-07 and the decisions should be taken by WRC-07 accordingly;
- 2 To recommend that decisions taken by WRC- 07, including any provisions for the protection of other services to which the bands in resolves 1 are allocated, and of passive services in the adjacent band, apply to all non GSO FSS systems in these bands filed to the Bureau after 5 July 2003.

The band 1 350-1 400 MHz is allocated on a primary basis to the radiolocation, fixed and mobile services in Region 1 and to the radiolocation service in Regions 2 and 3, and the footnotes Nos 5.149, 5.38 and 5.339 also apply to this band. The band 1 400- 1 427 MHz is allocated to the Earth exploration satellite service (EESS) (Passive) radio astronomy and space research (Passive) services on a primary basis in all Regions and footnote No. 5.340 also applies to this band. The band 1 427-1 429 MHz is allocated in all Regions to the space operation (Earth to space) fixed and mobile (except aeronautical mobile) services on a primary basis. The band 1 429 – 1 452 MHz is allocated on a primary basis to the fixed service in all Regions, to the mobile service (except aeronautical mobile) in Region 1 and to the mobile service in Region 2 and 3. It should also be noted that footnote No 5.341 also applies to the band 1 400 – 1 452 MHz and that footnote. No 5.342 also applies to the band 1 429 1 452 MHz in Region 1. As can be seen from this discussion of the existing allocations prior to WRC- 03, additional allocations in the frequency region are quite complicated as many other services are potentially impacted.

The Cpm-02 Report indicated that there were significant technical challenges to be overcome in some areas if existing services, particularly passive services, were to be protected from harmful interference from the operation of feeder links around 1.4 GHz. The report also indicated that studies in ITU-R were incomplete for the radio astronomy, EESS (Passive) space research aeronautical mobile (aeronautical mobile telemetry AMT) and radiolocation services. This posed some difficulties for WRC-03 and the Conference decided to make the secondary allocation for the MSS feederlinks subject to completion of this work.

Studies are on going in various IYU-R groups to complete work and to determine the technical and operational means of enabling the use of the MSS feederlink allocations while at the same time protecting the existing services. While the amount of work necessary is substantial the United states believes that these secondary allocations around 1.4 GHz to the fixed satellite service (FSS) for feeder links for non GSO satellite systems in the MSS with service links below 1 GHz will support the development of new services on a global basis and be very beneficial to many administration, especially those in developing countries.

CURRENT ALLOCATION

Frequency Band (MHz)	ITU Allocation		
	Region1	Region2	Region 3
1350-1400	FIXED MOBILE RADIOLOCATION 5.149 5.338 5.339	RADIOLOCATION 5.149 5.334 5.339	
1429-1452	FIXED MOBILE except aeronautical mobile 5.341 5.342	FIXED MOBILE 5.343 5.341	

MALAYSIAN ALLOCATION

Frequency Band (MHz)	Malaysian Allocation	Notes/Future use

1370-1400	RADIOLOCATION Space Research (passive) Earth Exploration-Satellite (passive) 5.149 5.339	Bands allocated to Radar. SRSP Ref: 510
1429-1452	FIXED MLA17 MOBILE 5.341	MLA17: The fixed service in the bands 1429MHz to 1452 MHz and 8400MHz to 8500MHz is for civil use only.

The assignment is reserved for Multi Access Radio System for communication to rural and remote areas. Use channeling plan ITU-R Recommendation F701. Telekom Malaysia confirm that they had since migrate MARS service to band 2.3 GHz .

The plan is also to cater for government use.

MALAYSIA's PRELIMINARY VIEW (1.17):

Malaysia supports the completion of studies, and testing and demonstrations to validate such studies, on operational means to facilitate sharing around 1.4 GHz, including the protection of the passive services in the band 1 400-1 427 MHz from unwanted emission. Upon the successful completion of these studies, test and demonstrations, Malaysia supports implementation of appropriate provisions in the Radio Regulations to protect existing services and the use of the bands 1 390-1 392 MHz and 1 430-1 432 MHz for non geostationary satellite feederlinks for mobile satellite links below 1 GHz operating in the fixed satellite service (April 9, 2004)

WP 4

(Fixed services include HAPS and Fixed Satellite Services above 3 GHz. Regulatory procedures and associated technical criteria applicable to satellite networks.)

[e-mail reflector: NPWG2007_WP4@cmc.gov.my]

WP 4a Desk Officer; (1.10, 1.12, 7.1-Res80)

Norizan Baharin

WP 4b Desk Officer; (1.8, 1.18, 1.19);

Ruzlan Zabidi

Consultative Committee;

Prof. Ir. Dr. Ahmad Faizal Mohd. Zain (Kuittho)

Faizah Zainal Abidin (TMB)

Dr. Ali R. Ebadi (BSS)

**WRC Agenda Items: 1.8, 1.18, 1.19, 1.10, 1.12,
7.1 (res80)**

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item:

1.10: To review the regulatory procedures and associated technical criteria of Appendix 30B without any action on the allotments, the existing systems or the assignments in the List of Appendix 30B.

ISSUE:

Review of the regulatory procedures and associated technical criteria in Appendix 30B of the Radio Regulations, without any action on allotment, the existing systems or the assignments in the List of Appendix 30B.

BACKGROUND:

The Appendix 30B provisions and associated plan for FSS was established by the WARC-ORB-88 Conference in 1988. Many Administrations are of the view that there are difficulties in the application of the provisions in AP30B, considering current technological developments compared to the technology available when the Plan was established 17 years ago.

WRC-2003 did not make significant changes on the regulatory procedures and associated technical criteria of Appendix 30B. Hence it was decided that WRC-2007 will review the regulatory procedures and associated technical criteria on the condition that the List of Appendix 30B is not altered.

The review on modification to Appendix 30B is being studied by ITU-R Working Party4A (WP4A) and the Special Committee (SC).

MALAYSIA'S PRELIMINARY VIEW (1.10):

Malaysia supports the improvement to the regulatory procedures and associated technical criteria of Appendix 30B and will monitor the work of ITU-R Study Groups in this aspect. Malaysia considers that modifications to the technical criteria should be based on the practical systems and latest satellite technologies.

ANNEX A:

ITU Table of Allocation:

4500-4800 MHz	FIXED FIXED-SATELLITE (Earth-to-space)(space-to-Earth)	
6700-7075MHz	FIXED FIXED-SATELLITE (Earth-to-space)(space-to-Earth)	
10.7 -11.7 GHz (11.20-11.45 GHz)	(Region 1) FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.441 5.484 MOBILE except aeronautical mobile	(Regions 2 & 3) FIXED FIXED-SATELLITE (SPACE-TO-Earth) 5.441 MOBILE except aeronautical mobile
12.75-13.25 GHz	FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space Research (deep space) (space-to-Earth)	

Malaysian Table of Allocation:

4500-4800 MHz	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE	For sharing between Fixed and Mobile Services
6700-7075MHz	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MLA34 MOBILE 5.458 5.458A 5.458B 5.458C MLA20	MLA34: The frequency bands filed for MEASAT satellite systems MLA20: For civil use only

10.7-11.7 GHz (11.20-11.45 GHz)	FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MLA34 MOBILE except aeronautical mobile	MLA34: Frequency bands filed for MEASAT satellite systems Possibility of band segregation to accommodate FSS (Ku band) Bands from 10.9-11.7 GHz allocated to Fixed services to be vacated by 2003
12.75-13.25 GHz	FIXED FIXED-SATELLITE (Earth-to- space) 5.441 MOBILE Space Research (deep space) (space-to-Earth)	Bands for sharing between Fixed Services and FSS

ANNEX B:

Information on existing users:

Frequency band	Current Assignments	Spectrum Plan Allocation and Notes
4500-4800 MHz	Fixed Service: - Operators: 1. Celcom Transmission (M) Sdn. Bhd. 2. Celcom (Malaysia) Bhd. 3. Telekom Malaysia Bhd. 4. Sarawak Shell Bhd.	FIXED FIXED-SATELLITE (space-to- Earth) 5.441 MOBILE (For sharing between Fixed and Mobile Services)
6700-7075MHz	Fixed Service: - Operators: 1. Telekom Malaysia Bhd. 2. Jabatan Penerbangan Awam Malaysia (DCA) 3. Celcom (Malaysia) Bhd. 4. Celcom Transmission (M)	FIXED FIXED-SATELLITE (space-to- Earth) 5.441 MLA34 MOBILE 5.458 5.458A 5.458B 5.458C MLA20

	<p>Sdn. Bhd. 5. Maxis Broadband Sdn. Bhd. 6. TM Cellular Sdn. Bhd. 7. DIGI Telecommunications Sdn. Bhd. 8. Jabatan Penyiaran Malaysia (RTM)</p> <p>Land Mobile Service:-</p> <p>Operator: 1. CQ Communications</p> <p>Aeronautical Service:-</p> <p>Operator: 1. Jabatan Penerbangan Awam Malaysia (DCA)</p>	<p>(MLA34: The frequency bands filed for MEASAT satellite systems)</p> <p>(MLA20: For civil use only)</p>
<p>10.7 -11.7 GHz (11.20-11.45 GHz)</p>	<p>Fixed Service:-</p> <p>Operators: 1. Celcom (Malaysia) Bhd. 2. Celcom Transmission (M) Sdn. Bhd.</p>	<p>FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MLA34 MOBILE except aeronautical mobile</p> <p>(MLA34: Frequency bands filed for MEASAT satellite systems)</p> <p>(Possibility of band segregation to accommodate FSS (Ku band))</p> <p>(Bands from 10.9-11.7 GHz allocated to Fixed services to be vacated by 2003)</p>
<p>12.75-13.25 GHz</p>	<p>Fixed Service:-</p> <p>Operators: 1. Celcom (Malaysia) Bhd. 2. Celcom Transmission (M) Sdn. Bhd. 3. Atlasone Sdn. Bhd. 4. DIGI Telecommunications Sdn. Bhd.</p>	<p>FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space Research (deep space) (space-to-Earth)</p>

	5. Maxis Mobile Sdn. Bhd. 6. MITV Corporation Sdn. Bhd. 7. Perbadanan Pembekalan Letrik Sarawak 8. Perkhidmatan Kaji Cuaca Malaysia 9. Telekom Malaysia Bhd. 10. Time Telecommunications Sdn. Bhd. 11. TM Cellular Sdn. Bhd.	(Bands for sharing between Fixed Services and FSS)
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ANNEX C:

5 – 15 years plan for the affected band

Malaysia’s Appendix 30B allocation:-

Nominal orbital position	78.5° East
Frequency bands	4500-4800 MHz (space-to-Earth) 6725-7025 MHz (Earth-to-space) 10.70-10.95 GHz (space-to-Earth) 11.20-11.45 GHz (space-to-Earth) 12.75-13.25 GHz (Earth-to-space)
Service Arc	76.4° - 143° (west to east)
Current assignments in Malaysia in these bands	Fixed, Mobile, aeronautical services

Similar to the views of the other countries, it will be very difficult for Malaysia to implement the FSS planned bands for national or sub-regional coverage because of the outdated technical parameters contained in Appendix 30B that was established in 1988.

If Malaysia wishes to implement its allotment in the said Plan, modification to the Plan needs to be done and it is a very complex process. In reality, very few countries have attempted this.

ANNEX D:

Positions taken by some other countries/organizations - for comparison

At this stage, most countries are of similar views where the said provisions in Appendix 30B need to be improved to take into account the latest developments in technology, future systems and consideration be given for a more practical systems that is viable.

Studies are still being carried out under ITU-R activities prior to Conference Preparatory Meeting (CPM-2007).

ANNEX E:

ITU Study Group/Task Group - schedule of reports and results

The WP4A and SC have not completed their work on this Agenda item. The final report will be available before the Conference Preparatory Meeting, March 2007.

ANNEX F:

Implication /Impact for this Agenda Item to the country

This agenda will impact Malaysia's future plan on the sharing of FIXED, FIXED-SATELLITE and MOBILE services in the following frequency bands:

4500-4800 MHz ;
6725-7025 MHz ;
10.70-10.95 GHz;
11.2-11.45 GHz;
12.75-13.25 GHz.

In the long term, MEASAT Satellite Systems Sdn. Bhd. or other potential satellite operator may wish to implement this plan. Improved regulatory procedures and associated technical criteria will certainly make it more attractive for Malaysia to convert the plan to assignment.

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item 1.12;

“to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: “Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks” in accordance with Resolution 86 (WRC-03)”

ISSUE:

Resolution **86 (Rev. Marrakech, 2002)** requested 2003 and subsequent WRC's to review and update the advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, including the associated technical characteristics , and the related appendices of the Radio Regulations, so as to:

- i) facilitate, in accordance with Article 44 of the Constitution, the rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries;
- ii) ensure that these procedures, characteristics and appendices reflect the latest technologies;
- iii) achieve simplification and cost savings for BR and administrations.

BACKGROUND:

WRC-03 adopted **Resolution 86**, which resolves that the scope and criteria of Resolution **86 (Rev. Marrakesh, 2002)** of the Plenipotentiary Conference to be considered by future WRCs be as follows:

1 to consider any proposals which deal with deficiencies in the advance publication, coordination and notification procedures of the Radio Regulations for space services which have either been identified by the Board and included in the

Rules of Procedure or which have been identified by administrations or by the Radiocommunication Bureau, as appropriate;

2 to consider any proposals which are intended to transform the content of the Rules of Procedure into a regulatory text;

3 to ensure that these procedures, characteristics and appendices reflect the latest technologies, as far as possible;

4 to consider any proposals intended to facilitate, in accordance with Article 44 of the Constitution, the rational, efficient and economical use of radio frequencies and the associated orbits including the geostationary orbit in accordance with *resolves 2 of Resolution 80 (Rev.WRC-2000)* and *resolves to request the 2003 and subsequent world radiocommunication conferences of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference*;

5 to consider any changes to provisions of the Radio Regulations for space services that would result in the simplification of the procedures and the work of the Bureau and/or administrations;

6 to consider any changes to the Radio Regulations that follow from decisions of a Plenipotentiary Conference on space matters.

MALAYSIA'S PRELIMINARY VIEW (1.12):

Malaysia supports the review and the simplification of the Advance publication, coordination, notification and recording procedures for satellite network filings. The Rules of Procedures adopted by the RRB should be minimized.

ANNEX A:

ITU Table of allocation
Malaysia table of allocation

Not Applicable.

ANNEX B:

Information on existing users

Measat Satellite Systems Sdn. Bhd.

Agensi ANGKASA Negara.

ANNEX C:

Up to 5 year plan for the affected band
5 – 15 years plan for the affected band

Not Applicable.

ANNEX D:

Positions taken by some other countries/organizations - for comparison

Support from ITU Member Administrations for the simplification of the procedures for satellite network filings in the Radio Regulations of the ITU.

ANNEX E:

ITU Study Group/Task Group - schedule of reports and results

The ITU-R Special Committee Working Group.

ANNEX F:

Implication /Impact for this Agenda Item to the country.

Simplification of the procedures in Articles 9 and 11 of the Radio Regulations will assist Malaysian regulatory authority and satellite network operators in processing satellite network filings with the ITU.

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item:

- 7.1 (part of): to consider and approve the Report of the Director of the Radiocommunication Bureau:
- on action in response to Resolution **80 (Rev.WRC-2000)**;

ISSUE:

Res.80 (Rev WRC-2000): Due diligence in applying the principles embodied in the Constitution.

BACKGROUND:

Res. 80 (Rev. WRC-2000) calls for the possible linking of formal notification, coordination and registration procedures in reference to Article 44 of the Constitution of ITU and preamble of Radio Regulations on the basic principles for the efficient usage of the radio frequency spectrum and the geostationary-satellite and other satellite orbits worldwide and instructs the Director of Radiocommunication Bureau (BR) to report on actions taken on this Resolution.

There has been no discussion on this, since Members are to evaluate the Report of the Director of BR to WRC-2007 with respect to action taken on Res. 80 (Rev. WRC-2000).

Under the same Resolution, the Radiocommunication Advisory Group (RAG) and the Radio Regulations Board (RRB) are required to study and consider possible recommendations and draft provisions linking of formal notification, coordination and registration procedures in reference to Article 44 of the Constitution of ITU and preamble of Radio Regulations.

The study on the Report of the Director of BR will be carried out once the Report is available.

MALAYSIA's PRELIMINARY VIEW (7.1- res 80):

View will be established once the BR Director Report is available.

ANNEX A:

ITU Table of allocation
Malaysia table of allocation
(Not relevant)

ANNEX B:

Information on existing users
Existing Malaysian affected user is the MEASAT satellite networks operator.

ANNEX C:

Up to 5 year plan for the affected band
5 – 15 years plan for the affected band

Malaysia has been affected through suppressions of a number of filings based on Due Diligence application.

ANNEX D:

Positions taken by some other countries/organizations - for comparison

ANNEX E:

ITU Study Group/Task Group - schedule of reports and results

Awaiting the Report of the Director of BR.

ANNEX F:

Implication /Impact for this Agenda Item to the country.

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Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item 1.8:

“to consider the results of ITU-R studies on technical sharing and regulatory provisions for the application of high altitude platform stations operating in the bands 27.5-28.35 GHz and 31-31.3 GHz in response to Resolution 145 (WRC-03), and for high altitude platform stations operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz in response to Resolution 122 (rev. WRC-03)”

ISSUE:

1. Resolution 145 (WRC-03) relates to potential use of the bands 27.5-28.35 GHz and 31-31.3 GHz by high altitude platform stations (HAPS) in the Fixed Service. It invites administrations to advise the Radiocommunication Bureau of their intention to implement HAPS systems within the band 27.5-28.35 GHz and in the band 31-31.3 GHz, and to specify the frequency bands (up to 300 MHz each within the 27.5-28.35 GHz and 31-31.3 GHz bands) they intend to use for such systems.
2. Resolution 122 (rev. WRC-03) relates to use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz by HAPS in the fixed service and by other services. It calls for the ITU-R to study as a matter of urgency the power limitations applicable for HAPS ground stations to facilitate sharing with space station receivers. ITU-R is also invited to study the regulatory provisions that might be needed to address cases whereby the deployment of HAPS in one country may affect other administrations.

BACKGROUND:

The provision of spectrum for HAPs was considered by the ITU via Resolution 122 (WRC-97) whereby HAPS is allowed to operate within the fixed service in the band 47.2-47.5 GHz and 47.9-48.2 GHz.²

² Footnote 5.552A - The allocation to the fixed service in the bands 47.2-47.5 GHz and 47.9-48.2 GHz is designated for use by high altitude platform stations. The use of the bands 47.2-47.5 GHz and 47.9-48.2 GHz is subject to the provisions of Resolution 122 (WRC-97)*. (WRC-97)

In the year 2000 some member countries requested for lower frequency bands to be identified for HAPS use due to high rain attenuation in the 48 GHz band. WRC-2000 decided then to adopt provisions for the operation of HAPS on a non-interfering/non-protected basis in the bands 27.5-28.35 GHz and 31-31.3 GHz in Region 3, but did not allow operation in the entire bands until studies could be completed to determine how best to protect existing services in these and nearby frequency bands.

At the WRC-03 ITU further refined these provisions by adopting Resolution 145 (WRC-03) which limits HAPS operation to a 300 MHz in a specified direction in each of these two bands. ITU also invited administrations to specify and advise the Radiocommunications Bureau on the frequency bands (up to 300 MHz each within the 27.5-28.35 GHz and 31-31.3 GHz bands) they intend to use for such systems. Administrations intending to implement HAPS in these bands are to seek the explicit agreement of concerned administrations in accordance with *resolves* 4 of this Resolution.

Under Resolution 145 (WRC-03), the use of HAPS must be limited, pending the completion of the feasibility studies, to 300 MHz in each band, and is subject to the condition that such use must not cause harmful interference to, nor claim protection from, other stations of services operating in accordance with the Table of Frequency Allocations of Article 5. Furthermore, the Resolution specifies that the development of these other services shall proceed without constraints by HAPS operating pursuant to the Resolution. With respect to the band 31-31.3 GHz, Resolution 145 (WRC-03) also specifies that systems using HAPS must not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion given in Recommendation ITU-R RA.769. The resolution contains limits on the level of unwanted power density into the HAPS ground station antenna in the band 31.3-31.8 GHz in order to ensure the protection of satellite passive services.

The operation of HAPS in the 27/31 GHz band is allowed in Malaysia, Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, Philippines, Kyrgyzstan, the Dem.

People's Rep. of Korea, Sri Lanka, Thailand and Vietnam in the Radio Regulation under footnotes **5.537A³** and **5.543A⁴**.

MALAYSIA'S PRELIMINARY VIEW (1.8):

Fixed service systems using HAPS could be a promising cost effective radiocommunication infrastructure to provide coverage for various broadband services in the near future especially for a country like Malaysia.

Malaysia could support any 300 MHz segment for the use of HAPS in the 27.5 – 28.35 GHz. Currently the band is shared with FSS(ETS) and LMCS in the FS. A draft SRSP (MCMC SRSP 509) has also been proposed for the LMCS.

Malaysia also supports the ITU-R study on regulatory provisions that might be needed to address cases whereby the deployment of HAPS in one country may affect other administrations.

³ **5.537A** In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.5-28.35 GHz may also be used by high altitude platform stations (HAPS). The use of HAPS within the band 27.5-28.35 GHz is limited, within the territory of the countries listed above, to a single 300 MHz sub-band.

Such use of 300 MHz of the fixed-service allocation by HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution **145 (WRC-03)**. (WRC-03)

⁴ **5.543A** In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by systems services shall not be constrained by HAPS. Systems using HAPS in the band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. **5.545**. Furthermore, the development of these into account the protection criterion as given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to -106 dB(W/MHz) under clear-sky conditions, and may be increased up to -100 dB(W/MHz) under rainy conditions to take account of rain attenuation, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions as given above. See Resolution **145 (WRC-03)**. (WRC-03)

ANNEX A:

ITU Table of Allocation:

Frequency Band (GHz)	ITU Allocation		
	Region1	Region2	Region 3
25.5-27		EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536A 5.536B FIXED INTER-SATELLITE 5.536 MOBILE Standard Frequency and Time Signal-Satellite (Earth-to-space)	
27-27.5	FIXED INTER-SATELLITE 5.536 MOBILE	FIXED FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE	
27.5-28.5		FIXED 5.357A FIXED-SATELLITE (Earth-to-space) 5.539 5.484A MOBILE 5.538 5.540	
28.5-29.1		FIXED FIXED-SATELLITE (Earth-to-space) 5.523A 5.539 5.484A 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 MOBILE Earth Exploration-Satellite (Earth-to-space) 5.541 5.540	

29.5-29.9	FIXED-SATELLITE (Earth-to-space) 5.539 5.484A Earth Exploration-Satellite (Earth-to-space) 5.541 Mobile-Satellite (Earth-to-space) 5.540 5.542	FIXED-SATELLITE (Earth-to-space) 5.539 5.484A 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	FIXED-SATELLITE (Earth-to-space) 5.539 5.484A Earth Exploration-Satellite (Earth-to-space) 5.541 Mobile-Satellite (Earth-to-space) 5.540 5.542
29.9-30	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		
30-31	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard Frequency and Time Signal-Satellite (space-to-Earth) 5.542		
31-31.3	FIXED 5.543A MOBILE Standard Frequency and Time Signal-Satellite (space-to-Earth) Space Research 5.544 5.545 5.149		
31.3-31.5	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340		
31.5-31.8	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.546	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149

Malaysia Table of Allocation:

Frequency Band (GHz)	Malaysian Allocation	Notes/Future use
25.5-27	EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536A FIXED MLA36 INTER-SATELLITE 5.536 MOBILE Standard Frequency and Time Signal-Satellite (Earth-to-space)	MLA36: The frequency band 24.25 – 27.00 GHz is allocated for Local Multipoint Communication Service (LMCS). The frequency bands 27.00 - 29.50 GHz and 31.00 - 31.30 GHz are reserved for extension band for LMCS / FSS.
27-27.5	FIXED MLA36 FIXED-SATELLITE (Earth-to-space) MLA34 INTER-SATELLITE 5.536 5.537 MOBILE	MLA36: The frequency band 24.25 – 27.00 GHz is allocated for Local Multipoint Communication Service (LMCS). The frequency bands 27.00 - 29.50 GHz and 31.00 - 31.30 GHz are reserved for extension band for LMCS / FSS. MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information
27.5-28.5	FIXED 5.351A MLA36 FIXED-SATELLITE (Earth-to-space) 5.539 5.484A MLA34 MOBILE 5.538 5.540	MLA36: The frequency band 24.25 – 27.00 GHz is allocated for Local Multipoint Communication Service (LMCS). The frequency bands 27.00 - 29.50 GHz and 31.00 - 31.30 GHz are reserved for extension band for LMCS / FSS. MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information Bands 27.5 to 28.35 GHz may be allocated to HAPS
28.5-29.1	FIXED FIXED-SATELLITE 5.523A 5.539 5.484A MOBILE Earth Exploration Satellite (Earth-to-space) 5.541	MLA36: The frequency band 24.25 – 27.00 GHz is allocated for Local Multipoint Communication Service (LMCS). The frequency bands 27.00 - 29.50 GHz and 31.00 - 31.30 GHz are reserved for extension band for LMCS / FSS. MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information
29.1-29.5	FIXED MLA36 FIXED-SATELLITE (Earth-to-space) 5.523C 5.523E 5.535A 5.539 5.541A MLA34 MOBILE Earth Exploration-Satellite (Earth-to-space) 5.541 5.540	MLA36: The frequency band 24.25 – 27.00 GHz is allocated for Local Multipoint Communication Service (LMCS). The frequency bands 27.00 - 29.50 GHz and 31.00 - 31.30 GHz are reserved for extension band for LMCS / FSS. MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information

29.5-29.9	<p>FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 MLA34</p> <p>Earth Exploration-Satellite (Earth-to- (Earth-to-space) 5.541</p> <p>Mobile-Satellite (Earth-to-space)</p> <p>Fixed</p> <p>Mobile</p> <p>5.540 5.542</p>	MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information
29.9-30	<p>FIXED-SATELLITE (Earth-to-space) 5.484A 5.539 MLA34</p> <p>MOBILE-SATELLITE (Earth-to-space)</p> <p>Earth Exploration-Satellite (Earth-to- space) 5.541 5.543</p> <p>Fixed</p> <p>Mobile</p> <p>5.525 5.526 5.527 5.538 5.540 5.542</p>	MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information
30-31	<p>FIXED-SATELLITE (Earth-to-space) MLA34</p> <p>MOBILE-SATELLITE (Earth-to-space)</p> <p>Standard Frequency and Time Signal- Satellite (space-to-Earth)</p> <p>Fixed</p> <p>Mobile</p> <p>5.542</p>	MLA34: The frequency bands filed for MEASAT Satellite Services are shown in Chapter III, Part 3.4 General Table of Frequencies Information
31-31.3	<p>FIXED 5.5543A MLA36</p> <p>MOBILE</p> <p>Standard Frequency and Time Signal- Satellite (space-to-Earth)</p> <p>Space Research 5.544 5.545</p> <p>5.149</p>	MLA36: The frequency band 24.25 – 27.00 GHz is allocated for Local Multipoint Communication Service (LMCS). The frequency bands 27.00 - 29.50 GHz and 31.00 - 31.30 GHz are reserved for extension band for LMCS / FSS.
31.3-31.5	<p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>RADIO ASTRONOMY</p> <p>SPACE RESEARCH (passive)</p> <p>5.340</p>	Bands allocated to EES.

31.5-31.8	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149	Bands allocated to EES.
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ANNEX B:

Information on existing users:

Currently there are no registered users in the band 27.5-28.35 GHz, 31.0 – 31.3 GHz, 47.2 – 47.5 GHz and 47.9 – 48.2 GHz.

Though MEASAT has filed for the frequency band 27/31G as noted in the Spectrum Plan it has not deployed the system in its existing plan.

The Spectrum Plan noted the bands 27.0 GHz to 29.5GHz and 31.0GHz to 31.3GHz as an extension band⁵ for the Local Multipoint Communication Service (LMCS) and FSS. A draft Standard Radio System Plan (SRSP) is being drafted for the LMCS⁶.

ANNEX C:

Up to 5 year plan for the affected band -TBD
5 – 15 years plan for the affected band -TBD

ANNEX D:

Positions taken by some other countries/organizations

1. APT

APT members generally support continued sharing studies between systems using HAPS and systems in other services as identified in Resolution 122 (Rev. WRC-03) for the band 47–48 GHz and Resolution 145 (WRC-03) for the band 27.5-28.35 GHz on a fair basis

⁵ the main band for the LMCS is 24.25GHz-27GHz

⁶ MCMC SRSP 509 – Requirements for Local Multipoint Communications Service(LMCS) Operating in the Frequency Band from 24.25GHz to 27.0 GHz, 27.0GHz to 29.5GHz and 31.0 GHz to 31.3GHz.

for all concerned parties. APT members will further consider and facilitate the studies under the above two Resolutions.

In particular, APT Members are encouraged to consider and possibly submit contributions, based on the study issues in Resolution 145 (WRC-03), on the identification of an appropriate 300 MHz segment in the band 27.5 – 28.35 GHz for use by HAPS in the countries listed in Nos. 5.537A and 5.543A at the next APG meeting.

In addition, one administration proposed that the footnotes 5.537A and 5.543A need to be modified with regard to application of non-harmful interference and non-protected basis for use of HAPS systems in the countries listed in these footnotes. This issue will be further considered at the future APG meetings.

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item 1.18 :

To review pfd limits in the band 17.7-19.7 GHz for satellite systems using highly inclined orbits, in accordance with **Resolution 141 WRC-03**);

ISSUE:

To Consider ITU-R studies to determine whether:

1. The current pfd limits for non-GSO systems in the FSS in Article 21 are adequate to protect the fixed service in the 17.7 GHz - 19.7 GHz band from non-GSO systems using highly-inclined orbits having an apogee altitude greater than 18000 km and an orbital inclination between 35° and 145°, without unduly constraining the use of these non-GSO FSS systems.
2. There are technical and operational measures in the band 17.7 GHz -19.7 GHz that could be implemented in the fixed service to mitigate interference from FSS space stations as described in (1) above.

BACKGROUND:

ITU-R studies to WRC-2000 considered highly-inclined orbit systems (HIO) as a sub- category of non-GSO satellite systems (non-GSO), and a small number of HIO systems have been operated successfully for many years, including in the 17.7-19.7 GHz band.

For the fixed service, the band 17.7-19.7 GHz is heavily used in many countries in particular for mobile telephone network infrastructure.

WRC-2000 modified the Article 21 power flux-density (pfd) limits for non-GSO satellite systems in the FSS in the band 17.7-19.3 GHz based on technical sharing studies involving non-GSO satellite systems using Low-Earth orbits (LEO).

ITU-R has commenced studies of the impact on fixed service stations of the pfd produced or to be produced by HIO space stations but it has not determined yet whether the current pfd limits for non-GSO FSS are adequate to protect the fixed service in the 17.7-19.7 GHz band from

HIO systems having an apogee altitude greater than 18000 km and an orbital inclination between 35° and 145°.

Resolution 141 (WRC-03) is a follow-on item from WRC-03 Agenda Item 1.37 on HEO satellites. The term “highly inclined orbit” non-GSO satellite systems was used instead of the term HEO in Resolution 141 (WRC-03). The term highly-inclined orbit, by itself, can include not only the HEO systems that were under study pursuant to the WRC-03 Agenda Item 1.37, but also some circular-orbit non-GSO systems that were not part of the Agenda Item 1.37 studies. This ambiguity has been noted in early discussions within the ITU-R Study Groups responsible for this agenda item.

WP 4-9S has initiated studies called for in Resolution 141 (WRC-03) in preparation for Agenda Item 1.18 for WRC-07. In Resolution 141 (WRC-03), the ITU-R has been invited to determine whether the current pfd limits applicable to non-geostationary orbit (non-GSO) satellite systems in the fixed satellite service (FSS) and contained in Article 21 are adequate to protect the fixed service in the 17.7 to 19.7 GHz band from HIO satellite systems¹, without unduly constraining the use of these non-GSO systems.

Resolution 141 (WRC-03) also calls for a determination to be made as to whether there are technical and operational measures that could be implemented by the fixed service to mitigate interference from FSS space stations.

MALAYSIA’S PRELIMINARY VIEW (1.18):

Malaysia could support the view on the need to continue studies to review the current PFD values for satellite systems using highly inclined orbits (HIO) to adequately protect the fixed service without unduly constraining these satellite systems in the band 17.7 – 19.7 GHz.

Malaysia also supports the view that satellite networks using HIOs should continue to be considered as non-GSOs and have the same regulatory procedure as other types of non-GSOs. There is no need to modify the Radio Regulations in a way that categorizes HIO non-GSO operations separately from other non-GSO systems.

ANNEX A: ITU Table of Allocation

Frequency Band (GHz)	ITU Allocation		
	Region1	Region2	Region 3
17.7-17.8	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	FIXED FIXED-SATELLITE (space-to-Earth) (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.518 5.515 5.517	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE
17.8-18.1		FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	
18.1-18.4		FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.520 MOBILE 5.519 5.521	
18.4-18.6		FIXED FIXED-SATELLITE (space-to-Earth) 5.484A MOBILE	
18.6-18.8	FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile EARTH EXPLORATION-SATELLITE (passive) Space research (passive) 5.522A 5.522C	EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile SPACE RESEARCH (passive) 5.522A	EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) 5.522B MOBILE except aeronautical mobile Space research (passive) 5.522A

Frequency Band (GHz)	ITU Allocation		
	Region1	Region2	Region 3
18.8-19.3	FIXED FIXED-SATELLITE (space-to-Earth) 5.523A MOBILE		
19.3-19.7	FIXED-SATELLITE (space-to-Earth) (Earth-to space) 5.523B 5.523C 5.523D 5.523E MOBILE		

Malaysia table of allocation

Frequency Band (GHz)	Malaysian Allocation	Notes/Future use
17.7-18.1	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MLA34 MOBILE	MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information Band 17.7 - 22.2 GHz may be allocated for VSAT (Down-link) Ka-band A portion of the band is allocated for Fixed Links SRSP Ref: 527
18.1-18.4	FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.520 MLA34 MOBILE 5.519	MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information Band 17.7 - 22.2 GHz is allocated for VSAT (Down-link) Ka-band. A portion of the band is allocated for Fixed Links SRSP Ref: 527

<p>18.4-18.6</p>	<p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth) 5.484A MLA34</p> <p>MOBILE</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>Band 17.7 - 22.2 GHz is allocated for VSAT (Down-link) Ka-band.</p> <p>A portion of the band is allocated for Fixed Links</p> <p>SRSP Ref: 527</p>
<p>18.6-18.8</p>	<p>EARTH EXPLORATION-SATELLITE (passive)</p> <p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth) 5.522B MLA34</p> <p>MOBILE except aeronautical mobile</p> <p>Space research (passive) 5.522A</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>Band 17.7 - 22.2 GHz is allocated for VSAT (Down-link) Ka-band.</p> <p>A portion of the band is allocated for Fixed Links</p> <p>Band 18.6 - 18.8 GHz may be allocated to EES</p> <p>SRSP Ref: 527</p>
<p>18.8-19.3</p>	<p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth) 5.523A MLA34</p> <p>MOBILE</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>A portion of the band is allocated for Fixed Links</p> <p>SRSP Ref: 527</p>
<p>19.3-19.7</p>	<p>FIXED</p> <p>FIXED-SATELLITE (space-to-Earth) (Earth-to space)</p> <p>5.523B 5.523C 5.523D 5.523E MLA34</p> <p>MOBILE</p>	<p>MLA34: The frequency bands filed for MEASAT Satellite Services are as shown in Chapter III, Part 3.4 General Table of Frequencies Information</p> <p>A portion of the band is allocated for Fixed Links</p> <p>SRSP Ref: 527</p>

ANNEX B:

Information on existing users

Currently there are 1912 registered fixed links in the band 17.7 GHz to 19.7 GHz

ANNEX C:

Up to 5 year plan for the affected band

Fixed, Fixed Satellite, Mobile

5 – 15 years plan for the affected band

Fixed, Fixed Satellite, Mobile

ANNEX D:

Preliminary position taken by the Asia Pacific Telecommunity organisation (APT):

APT members generally support continued studies to review the current PFD values for satellite systems using highly inclined orbits (HIO) to adequately protect the fixed service without unduly constraining these satellite systems in the band 17.7 – 19.7 GHz.

Satellite networks using HIOs should continue to be considered as non-GSOs and have the same regulatory procedure as other types of non-GSOs. There is no need to modify the Radio Regulations in a way that categorizes HIO non-GSO operations separately from other non-GSO systems, but the characterization may be addressed in an ITU-R Recommendation.

Some members are of the view that satellite systems using HIO mentioned in Resolution 141 should include those using elliptical orbits or circular orbits having characterization in considering g) of that Resolution, while some other members consider that it applies only to those using elliptical orbits. These different views may be based on the ambiguous wording in Resolution 141. Therefore, it is view of APT members that this issue needs to be clarified.

ANNEX E:

ITU Study Group/Task Group - schedule of reports and results

ANNEX F:

Implication /Impact for this Agenda Item to the country

Currently the band 17.7 GHz to 19.7 GHz is heavily used in Malaysia for fixed services and the utilisation is expected to continue in the future. Though they are not affected by the non- GSO systems the study by ITU-R would mitigate any possible interference in the future.

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item 1.19 :

To consider the results of the ITU-R studies regarding spectrum requirements for global broadband satellite systems in order to identify possible global harmonised FSS frequency bands for the use of Internet applications, and consider the appropriate regulatory/technical provisions, taking also into account No. 5.516B⁷ of the Radio Regulations.

ISSUE:

To identify possible global harmonized fixed-satellite service frequency bands for the use of Internet applications, and consider the appropriate regulatory/technical provisions.

BACKGROUND:

The agenda item was proposed at WRC-03 in order to foster the development of systems providing global broadband satellite access for internet, especially in developing countries as a way to bridge "digital divide".

⁷ **5.516B** *The following bands are identified for use by high-density applications in the fixed-satellite service:*

17.3-17.7 GHz (space-to-Earth) in Region 1,
18.3-19.3 GHz (space-to-Earth) in Region 2,
19.7-20.2 GHz (space-to-Earth) in all Regions,
39.5-40 GHz (space-to-Earth) in Region 1,
40-40.5 GHz (space-to-Earth) in all Regions,
40.5-42 GHz (space-to-Earth) in Region 2,
47.5-47.9 GHz (space-to-Earth) in Region 1,
48.2-48.54 GHz (space-to-Earth) in Region 1,
49.44-50.2 GHz (space-to-Earth) in Region 1,
and
27.5-27.82 GHz (Earth-to-space) in Region 1,
28.35-28.45 GHz (Earth-to-space) in Region 2,
28.45-28.94 GHz (Earth-to-space) in all Regions,
28.94-29.1 GHz (Earth-to-space) in Region 2 and 3,
29.25-29.46 GHz (Earth-to-space) in Region 2,
29.46-30 GHz (Earth-to-space) in all Regions,
48.2-50.2 GHz (Earth-to-space) in Region 2.

This identification does not preclude the use of these bands by other fixed-satellite service applications or by other services to which these bands are allocated on a co-primary basis and does not establish priority in these Radio Regulations among users of the bands. Administrations should take this into account when considering regulatory provisions in relation to these bands. See Resolution 143 (WRC-03). (WRC-03)

There is no corresponding WRC Resolution. The new agenda item was intended to study the possibility of identifying global harmonized FSS frequency bands for the use of internet applications, also taking into account No.5.516B, which is a new footnote identifying a number of bands for use by high-density applications in the FSS above 17.3 GHz.

MALAYSIA PRELIMINARY VIEWS (1.19) :

Malaysia could support the view that the FSS allocations have been available for over 25 years. As a consequence, cost effective satellite technology has evolved. There has been a proliferation of different size earth stations which can be used for different types of applications including Internet applications. In addition, during this time, as the applications using the FSS have developed and changed, changes to the basic Radio Regulations applicable to them have not been necessary. Thus the identification of specific FSS frequency bands for Internet applications will not improve nor will it facilitate the provision of these applications. Consequently, no changes to the Radio Regulations are necessary in order to accommodate Internet applications in the FSS.

ANNEX A: ITU Table of Allocation

Not relevant

Malaysia table of allocation

Not relevant

ANNEX B:

Information on existing users

Not relevant

ANNEX C:

**Up to 5 year plan for the affected band
5 – 15 years plan for the affected band**

Not relevant

ANNEX D:

Preliminary positions taken by some other organizations:

Asia Pacific Telecommunity (APT)

APT members generally support:

- the scope of this agenda item to bring available, through economical ground terminals, broadband satellite systems for Internet applications on a global scale;
- continued studies on frequency bands allocated to the FSS including those mentioned in RR 5.516B.

The current Radio Regulations can fully accommodate the ability of FSS systems to provide Internet access..

Conference Preparatory Meeting (CPM)

There are many existing and planned systems in a number of different FSS frequency bands (4/6 GHz, 11/14 GHz, and 20/30 GHz) fully capable of providing broadband/internet applications on a global basis. The identification of specific FSS frequency bands for Internet applications will not improve nor will it facilitate the provision of these applications. Consequently, no changes to the Radio Regulations are necessary in order to accommodate Internet applications in the FSS.

ANNEX E:

ITU Study Group/Task Group - schedule of reports and results

ITU-R has developed a new Question 269/4, which is to be studied by Working Party 4A in conjunction with the studies for this agenda item. This Question addresses the following points:

- the frequency spectrum requirements for the provision, on a worldwide basis, of high-speed Internet;
- the frequency bands that could be identified in the short-, medium- and long- term for the provision of high-speed Internet;
- the technical and operational characteristics that could facilitate the mass production of simple (VSAT) terminal equipment at affordable prices.

ANNEX F:

Implication /Impact for this Agenda Item to the country

The identification of a global harmonised band specifically for broadband satellite system specifically for internet applications would definitely affect existing services in the band.

WP 5

(Services in LF, MF and HF bands)

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Desk Officer;

Abdul Mubin Mohd. Zain

Consultative Committee;

Ahmad Abdullah (RTM)

Prof. Dr. Ahmad Zuri Sha'ameri (UTM)

WRC Agenda Items: 1.13, 1.15

Malaysia

PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item Agenda Item 1.13

WRC-2007 Agenda Item:

Agenda Item 1.13: taking into account [Resolutions 729 \(WRC-97\)](#), [351 \(WRC-03\)](#) and [544 \(WRC-03\)](#), to review the allocations to all services in the HF bands between 4 MHz and 10 MHz, excluding those allocations to services in the frequency range 7000 - 7200 kHz and those bands whose allotment plans are in Appendices 25, 26 and 27 and whose channelling arrangements are in Appendix 17, taking account of the impact of new modulation techniques, adaptive control techniques and the spectrum requirements for HF broadcasting

ISSUES:

1. Resolution **729 (WRC-97)**, to consider frequency assignments for frequency adaptive systems in frequency bands allocated for fixed/mobile services operation.
 - a. **CPM report, Issue (A)** *resolves 2* - that frequency adaptive systems shall automatically limit simultaneous use of frequencies to the minimum necessary for communication requirements.
 - b. **CPM report, Issue (B)** *resolves 3* - that with a view to avoiding harmful interference, the system should evaluate the channel occupancy prior to and during operation.
2. Resolution **351 (WRC-03)**, that, as soon as ITU-R studies are completed, a future competent conference should consider necessary changes to Appendix 17 to enable the use of new technology by the maritime mobile service (MMS).
 - a. **CPM report, Issue (C)** - *invites ITU-R* to finalize studies currently ongoing:
 - i. to identify future requirements of the MMS;
 - ii. to identify the technical characteristics necessary to facilitate use of digital systems in the MF and HF bands allocated to the MMS taking into account any relevant ITU-R Recommendations;
 - iii. to identify the digital system(s) to be used in the MF/HF bands by the MMS;
 - iv. to identify any necessary modifications to the frequency table contained within Appendix 17;

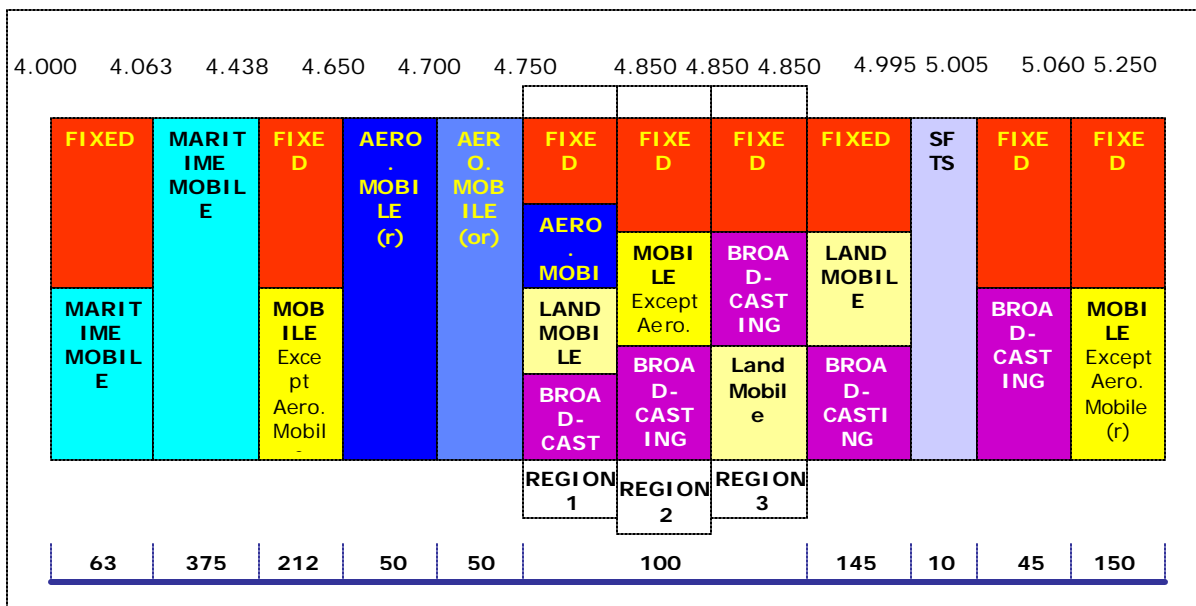
- v. to propose a timetable for the introduction of new digital technologies and any consequential changes to Appendix 17;
- vi. to recommend how digital technologies can be introduced while ensuring compliance with distress and safety requirements

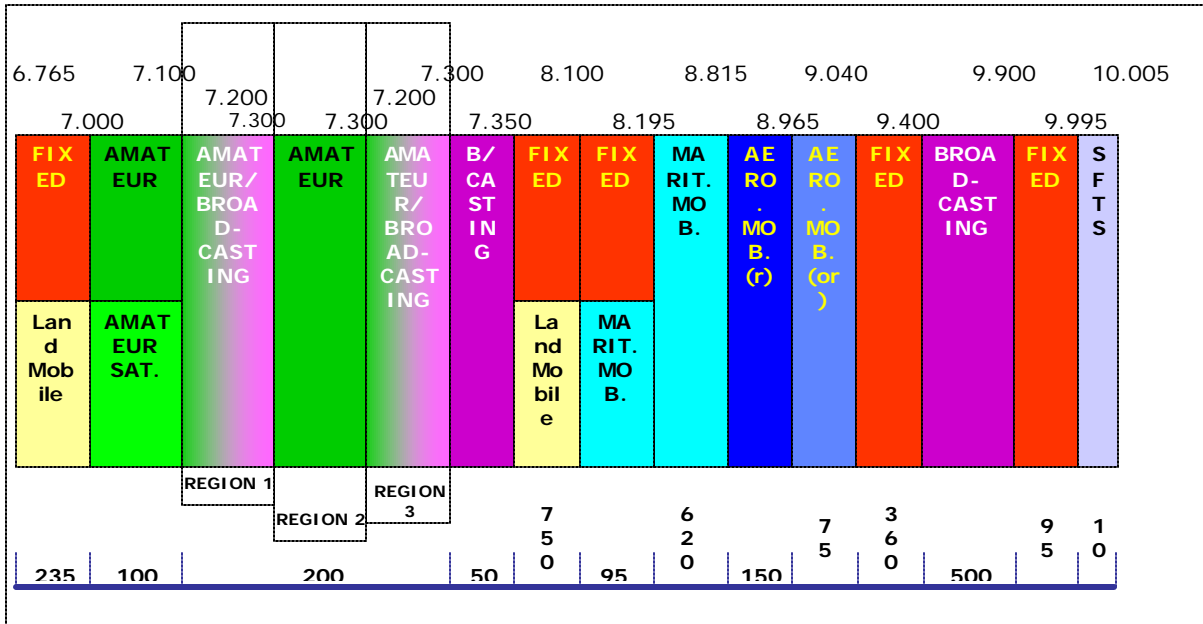
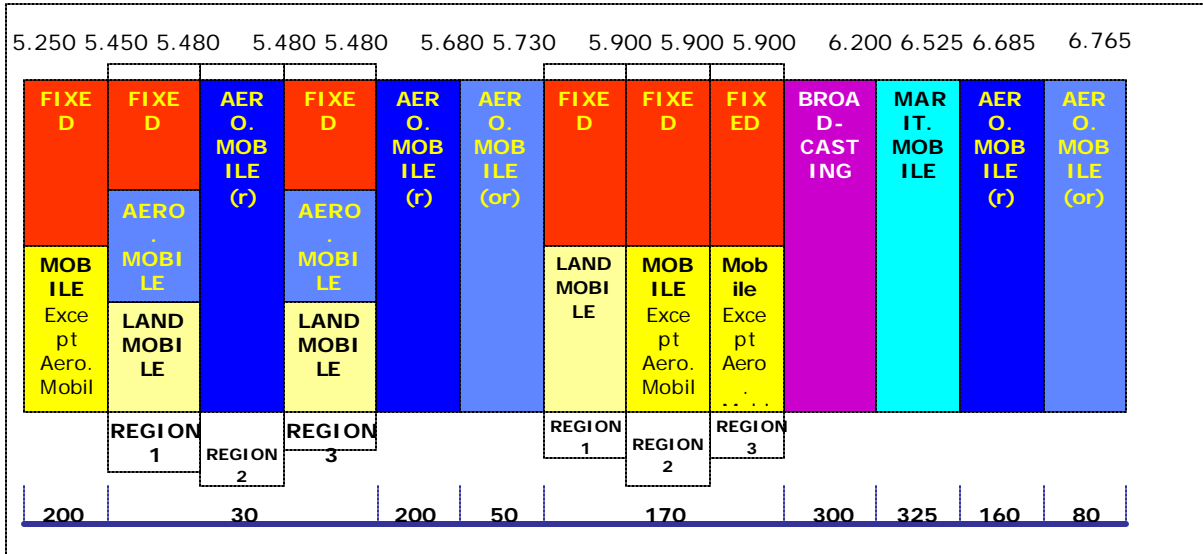
3. Resolution **544 (WRC-03)**, to consider identification of additional spectrum for HF broadcasting between 4-10 MHz. In particular, with focus on the bands 4500 - 4650 kHz, 5060-5250 kHz, 5840-5900 kHz, 7350-7650 kHz, 9290-9400 kHz & 9900-9940 kHz
 - a. **CPM report, Issue (D)** - Identification of additional spectrum for the broadcasting service in the HF bands.

BACKGROUND:

Spectrum Allocation in the HF band (4 MHz to 10 MHz)

Generally, the band 4 MHz to 10 MHz was allocated to several types of services in Malaysia as stated in the National Spectrum Plan. Detail allocations are shown in the Diagram 2 below.





In the Diagram 2 above, its shown that some of the spectrum was allocated to a single service (exclusive allocation) and some are allocated to more than 1 service (sharing allocation). Further more, each service was allocated with a different bandwidth. Details are as in the Table 2 below.

NO.	SERVICE	TOTAL BANDWIDTH (kHz)	
		EXCLUSIVE ALLOCATION	SHARING ALLOCATION

1	FIXED	455	2195
2	MOBILE except Aero. Mob(r)	-	562
3	BROADCASTING	1050	290
4	AERONAUTICAL (r)	500	-
5	AERONAUTICAL (or)	255	30
6	MARITIME	1320	158
7	AMATEUR	-	100
8	AMATEUR SATELLITE	-	100
9	LAND MOBILE	-	175
10	STANDARD FREQ. & TIME SIGNAL	15	-
11	Mobile except Aero. Mob (r)	-	170

From the Diagram 2 above also, several frequency blocks was allocation was allocated to Fixed and Mobile Service. Details are as shown in the Table 3 below.

FREQUENCY RANGE (MHz)	SERVICE		
4.4380 – 4.6500	FIXED	MOBILE except Aero. Mobile (r)	
4.8500 – 4.9950	FIXED	LAND MOBILE	BROADCASTING
5.0600 – 5.2500	FIXED	MOBILE except Aero. Mobile (r)	
5.2500 – 5.4500	FIXED	MOBILE except Aero. Mobile (r)	
5.7300 – 5.9000	FIXED	MOBILE except Aero. Mobile (r)	
6.7650 – 7.0000	FIXED	Land Mobile	
7.3500 – 8.1000	FIXED	Land Mobile	
8.1000 – 8.1950	FIXED	MARITIME MOBILE	
9.0400 – 9.4000	FIXED		
9.9000 – 9.9950	FIXED		

Current User (Registered in AFMS Database)

The frequency band in the 4 MHz to 10 MHz currently was assigned to certain user nationwide via apparatus assignment. The spectrum assignees are from government agencies and private networks. Detail users as registered in the AFMS are as Table 4 below.

SERVICE	ALLOCATION	USERS
FIXED	EXCLUSIVE (455 kHz)	Government Agency: UTM, Persatuan Bulan Sabit Merah & Jabatan Laut Private: Nippon Oil, Adfa Holding, Talisman, Saipem, MHS Aviation & Carigali Triton
	SHARING (2195 kHz)	Government Agency: JHEOA, DCA, Jab. Kastam, Pejabat Perhutanan Negeri, Jabatan Kajibumi, Jab. Kesihatan Negeri (Sarawak), Jab. Pendidikan Negeri (Sarawak), RTM, Jab. Perhutanan Sarawak, Jab. Pertanian Sarawak & Kementerian Luar Negeri. Private: Sarawak Shell, MHS Aviation, Sabah Shell, Golden Hope Plantation, Sabah Electricity, Kastima Lumber

SERVICE	ALLOCATION	USERS
BROAD-CASTING	EXCLUSIVE (1050 kHz)	Government Agency: UTM, JHEOA, Jabatan Kastam, Persatuan Bulan Sabit Merah & RTM. Private: Carigali Triton Operating Co.
	SHARING (290 kHz)	Government Agency: RTM. Private: None.

SERVICE	ALLOCATION	USERS
AMATEUR & AMATEUR SATELLITE	EXCLUSIVE (100 kHz)	Government Agency: UTM & Persatuan Bulan Sabit Merah. Private: None.

SERVICE	ALLOCATION	USERS
MOBILE except Aero. Mobile (R)	EXCLUSIVE (562 kHz)	Government Agency: JHEOA & TMB.

	<p>Private: Exxonmobil Exploration, Sarawak Shell, Sabah Shell, Carigali Triton, Borneo Airways.</p>
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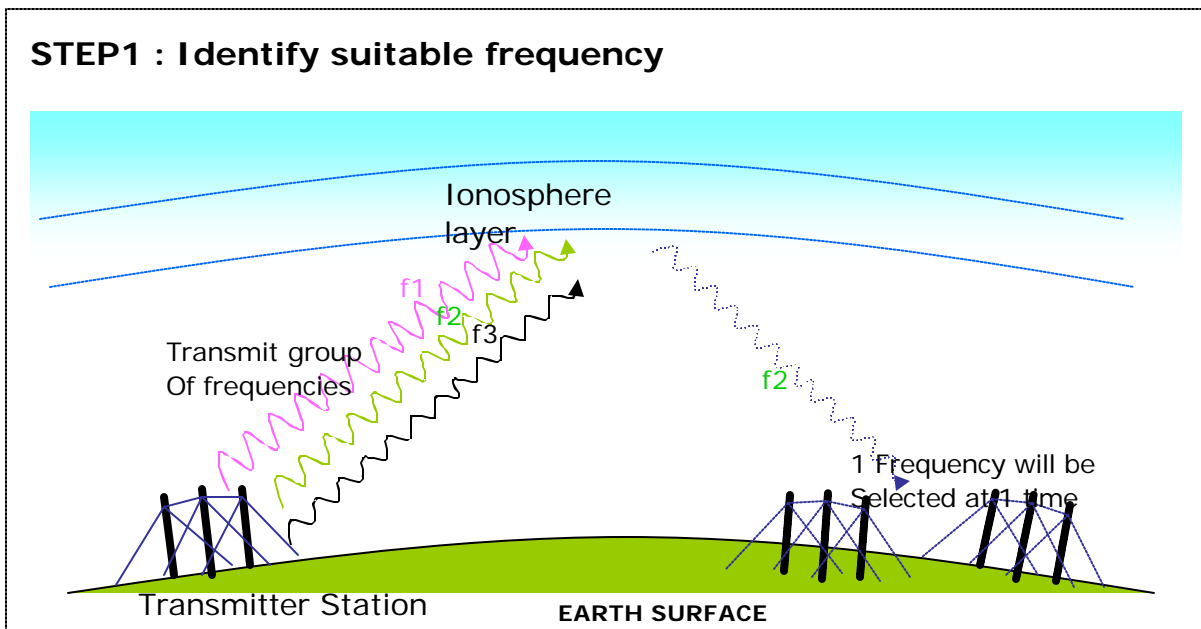
Resolution 729 (WRC-97)

- **Frequency Adaptive System (A new modulation technic)**

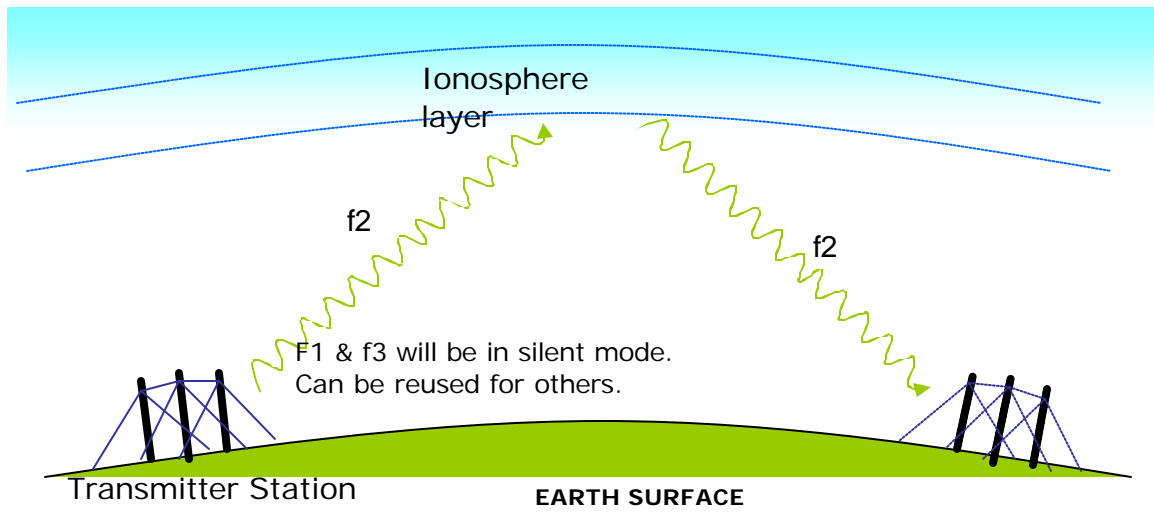
Newer adaptive systems use lower power and are frequency agile. The transmit frequencies may change often and spread the traffic over a larger number of frequencies.

For adaptive systems the efficiency is higher as more frequencies are available for these systems. Efficiency in this respect does not mean that less spectrum is needed.

Automatic link establishment (ALE) advancements have led to the development from single frequency dependent link utilization to a robust, and more efficient, state-of-the-art technology using a HF network architecture based upon using multiple ground stations. This enhanced ALE uses multiple stations to analyse a received mobile call simultaneously, and then the best station on the most optimal frequency establishes the link.



STEP 2 : 1 frequency will be active (select)



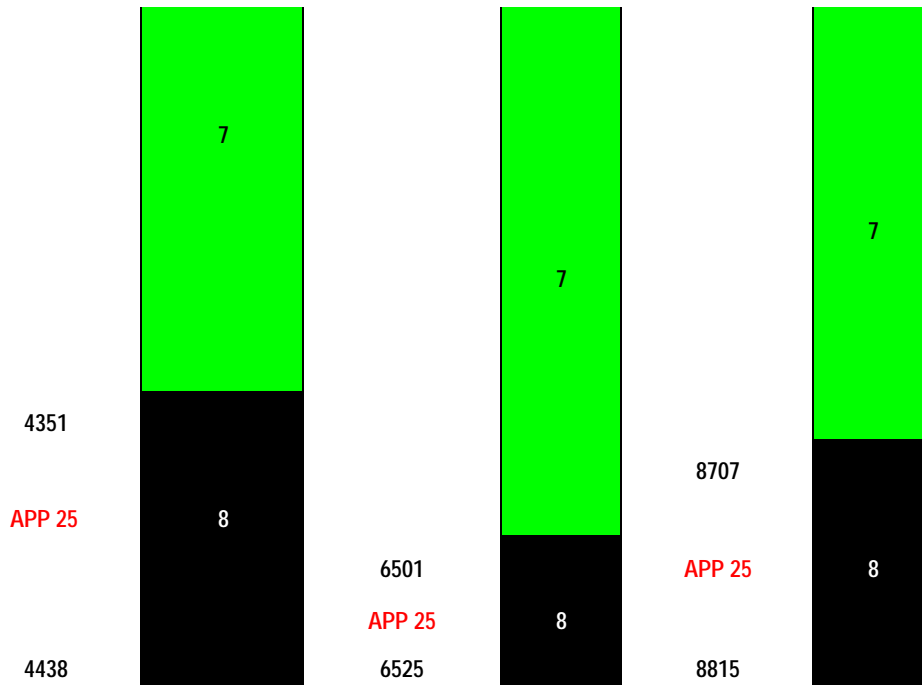
Resolution 351 (WRC-03)

- The Spectrum Plan was allocated few blocks of spectrum to the Maritime Mobile Service (MMS) in the band 4 MHz to 10 MHz. Current users are from Government Agencies (Marine Department) and Operator (TMB).
- Details frequency allocated to MMS service is shown in the Table 5 below.

FREQUENCY BAND (kHz)	BANDWIDTH (kHz)	SERVICE
4000 – 4063	63	FIXED MMS
4063 – 4438	375	MMS
6200 – 6525	325	MMS
8100 – 8195	95	FIXED MMS
8195 – 8815	620	MMS
TOTAL	1478 (1320 kHz exclusive + 160 kHz shared)	

- Detail channeling plan and channel allotment plan for MMS is shown in the Diagram 3 below. The plans are according to the Appendix 17 of ITU-R Radio Regulation.





1

Ship stations, telephony, duplex operation (two-frequency channels), (frequencies paired with those in No. 8), (Appendices 17, Part B, Section I and 25, Section II)

2

Ship stations and coast stations, telephony, simplex operation (single-frequency channels) and intership cross-band operation (two frequencies), ((Appendix 17, Part B, Section I, Sub-Section B)

3

*Ship stations, wide-band telegraphy, facsimile and special transmission systems, (Appendix 17, Part A)
Oceanographic*

4

data transmission stations, (Appendix 17, Part A, Note c))

5

Ship stations, narrow-band direct-printing telegraphy and data transmission systems at speeds not exceeding 100 bauds for FSK and 200 bauds for PSK (non-paired frequencies), and A1A Morse telegraphy (working), (Appendix 17, Part B, Section III)

6

Ship stations, A1A Morse telegraphy, calling, (Appendix 17, Part B, Section IV)

7

Coast stations, wide-band and A1A Morse telegraphy, facsimile and special and data transmission systems and direct printing telegraphy systems, (Appendix

17, Part A)

8

Coast stations, telephony, duplex operation (two-frequency channels), (frequencies paired with those in No. 1), (Appendices 17, Part B, Section I and 25, Section II)

9

Ship stations, narrow-band direct-printing telegraphy and data transmission systems at speeds not exceeding 100 bauds for FSK (Appendices 17, Part B, Section I and 25, Section II) and 200 bauds for PSK (frequencies paired with those in No. 10), (Appendix 17, Part B, Section II)

10

Coast stations, narrow-band direct-printing telegraphy and data transmission systems at speeds not exceeding 100 bauds for FSK and 200 bauds for PSK (frequencies paired with those in No. 9), (Appendix 17, Part B, Section II)

11

Ship stations, A1A Morse telegraphy, working, (Appendix 17, Part B, Section V)

12

Ship stations, digital selective calling, (Appendix 17, Part A)

13

Coast stations, digital selective calling, (Appendix 17, Part A)

P

These sub-bands, except the frequencies referred to in Notes *j*), *n*) and *o*), may be used for the initial testing and the possible future introduction within the maritime mobile service of new digital technologies. Stations using these sub-bands for this purpose shall not cause harmful interference to,

or

and shall not claim protection from, other stations operating in accordance with Article 5.

P 10

Resolution 544 (WRC-03)

- Will study on the band as below:
 - i. 4500 kHz – 4650 kHz : 150 kHz bandwidth;
 - ii. 5064 kHz – 5250 kHz : 186 kHz bandwidth;
 - iii. 5840 kHz – 5900 kHz : 60 kHz bandwidth;
 - iv. 7350 kHz – 7650 kHz : 300 kHz bandwidth;
 - v. 9290 kHz – 9400 kHz : 110 kHz bandwidth;
 - vi. 9900 kHz – 9940 kHz : 40 kHz bandwidth.
- Report submitted by ITU-R SG6/8 on this issues was divided into 3 method i.e.:
 - i. Method A - Additional allocations of 800 kHz in total to HF broadcasting service in the 4-10 MHz frequency range.

- ii. Method B - Additional allocation between greater than 250 to less than 800 kHz in total to HF broadcasting service in the 4-10 MHz frequency range.
 - iii. Method C - Additional allocation of 250 kHz in total to HF broadcasting service in the 4-10 MHz frequency range.
- Most of the frequencies listed above are allocated to Fixed and Mobile Service before. The main users are from government agencies and operators.

MALAYSIA'S PRELIMINARY VIEWS (1.13):

1. Resolution 729 (WRC-97)

Before this resolution can be resolved, development of an ITU-R Recommendation for technical and operational characteristics for HF Frequency Adaptive systems is needed.

2. Resolution 351 (WRC-03)

Given the vital nature of the safety systems listed in Appendix 17 of the ITU-R Radio Regulations (RR), that a thorough review of digital techniques for the HF/MF bands must be accomplished before any changes to Appendix 17 are made.

3. Resolution 544 (WRC-03)

Malaysian accepts the case for extra broadcasting spectrum as indicated in this Resolution and will aim to satisfy this need, but also recognizes the need for sufficient spectrum of other affected services in the range 4 MHz to 10 MHz to be taken into account.

It must be understood that any additional spectrum given to the broadcasting service will be taken from the fixed and mobile service. For this reason Malaysian has to find mitigation measures in order to reach a large consensus in the fixed and mobile community.

Malaysia
PRELIMINARY VIEWS ON WRC-07
WRC-2007 Agenda Item Agenda Item 1.15

WRC-2007 Agenda Item:

Agenda Item 1.15: to consider a secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz;

ISSUES:

to consider a secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz.

Background

In the period 1994-2004, more than 20 administrations have given domestic amateur allocations or have authorized experimental amateur communications in the low-frequency range including 73 kHz, 135.7-137.8 kHz, and 160-190 kHz.

In 1997, amateurs in Europe were given formal authority to operate in an LF band pursuant to the European Conference of Postal and Telecommunications Administrations (CEPT) Recommendation 62-01 E (Mainz 1997), which pertains to the use of the band 135.7-137.8 kHz by the amateur service. Currently, amateurs are active in the band 135.7-137.8 kHz in more than 25 European countries. Operation in the Russian Federation has been authorized in both the European and Asiatic parts of the Federation.

In Region 3 New Zealand has granted an allocation to the amateur service in this band, and Australia has authorized some experimental communication.

In Region 2, a number of South American countries have authorized amateur use of the 135.7-137.8 kHz band, and Canadian and American amateurs have been conducting communications under experimental licences. With the approval of the CEPT Recommendation in Europe, France has also authorized the use of the band 135.7-137.8 kHz by St. Pierre and Miquelon, Martinique and Guadeloupe.

In Malaysia, the band was allocated to fixed, Mobile and Radionavigation on primary allocation. However, there are no users identify was assigned in this frequency band.

b. Summary of technical and operational studies, and relevant ITU-R Recommendations

The use of digital processing to recover very weak signals permits long distance communications at a low transmitted e.i.r.p. This fact, combined with a high atmospheric noise level, and the propagation characteristics of the 135.7-137.8 kHz band greatly reduces the potential of interference to other services.

An allocation of an LF band to the amateur service would be in accordance with *recommends* 1 and 3 of Recommendation ITU-R M.1044-2.

c. Analysis of the results of studies

No cases of interference to other services from amateur service operations in the frequency band 135.7-137.8 kHz have been reported. The frequency band 135.7-137.8 kHz is allocated on primary basis to fixed and maritime mobile services in the three Regions and to the radiolocation service in Region 3.

Footnote 5.67 provides an Additional allocation in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, to the radionavigation service on a secondary basis.

With a secondary allocation, amateur stations are obliged not to interfere with stations of primary services operating in accordance with the Table of Frequency Allocations; additional provision is needed to offer appropriated protection to stations operating in accordance with footnote 5.67.

d. Methods to satisfy the agenda item

e. Method A

Addition of a footnote to the Table of Frequency Allocations to allow for the use of the band 135.7-137.8 kHz by the amateur service in all three Regions on a secondary basis, with a maximum radiated power limit of 1 W (e.i.r.p.).

The following is an example of a possible modification to the Article 5 Table of Frequency Allocations, offering appropriate protection to radionavigation service for countries listed in RR 5.67.

Frequency Allocations

MOD (Modification to Table of Frequency Allocation – Article 5) 130 – 148.5/160.0 kHz

Allocation to services		
Region 1	Region 2	Region 3
130-148.5 FIXED MARITIME MOBILE 5.64 5.67 ADD 5.XXX	130-160 FIXED MARITIME MOBILE 5.64 ADD 5.XXX	130-160 FIXED MARITIME MOBILE RADIONAVIGATION 5.64 ADD 5.XXX

NOC (No Change)

5.64 Only classes A1A or F1B, A2C, A3C, F1C or F3C emissions are authorized for stations of the fixed service in the bands allocated to this service between 90 kHz and 160 kHz (148.5 kHz in Region 1) and for stations of the maritime mobile service in the bands allocated to this service between 110 kHz and 160 kHz (148.5 kHz in Region 1). Exceptionally, class J2B or J7B emissions are also authorized in the bands between 110 kHz and 160 kHz (148.5 kHz in Region 1) for stations of the maritime mobile service.

NOC (No Change)

5.67 *Additional allocation:* in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 130-148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate.

ADD (Addition/new)

5.XXX *Additional allocation:* the band 135.7-137.8 kHz is also allocated to the amateur service on a secondary basis. Stations of the amateur service using frequencies in this band shall not exceed a maximum radiated power of 1W (e.i.r.p.), and shall not cause harmful interference to stations of the radionavigation service operating in countries listed in provision 5.67. (WRC-07)]

Reasons: A secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz would harmonize on a worldwide basis the use of this band.

Advantages

A secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz would:

- be in harmony with similar allocations that have been approved or are being sought in North America, Europe, Australia, New Zealand and part of Asia;
- provide radio amateurs with the opportunity to participate in and contribute to a new aspect of radiocommunications and which would be consistent with the basis and purpose of the amateur service and would further the self-training in the radio art that is a principal obligation of the amateur service;
- provide an opportunity for experimentation with equipment, techniques, antennas and propagation phenomena in an interesting frequency band heretofore unavailable to the amateur service;
- provide an opportunity for experimentation of potential benefit to other services in keeping with the amateur service's tradition of contributing to the development of radiocommunication techniques and practices; and
- recognize the value of experimentation in attracting young people to the amateur service.

Disadvantages

None foreseen.

f. Method B

Addition of a new entry to the Table of Frequency Allocations to allow for the use of the band 135.7-137.8 kHz by the amateur service in all three Regions on a secondary basis, with a footnote limiting the maximum radiated power to 1 W (e.i.r.p.).

The following is an example of a possible modification to the Article 5 Table of Frequency Allocations, offering appropriate protection to radionavigation service for countries listed in RR 5.67.

Frequency Allocations

MOD (Modification to Table of Frequency Allocation – Article 5)

130-160 kHz

Allocation to services		
Region 1	Region 2	Region 3
130-148.5-135.7 FIXED MARITIME MOBILE 5.64 5.67	130-160-135.7 FIXED MARITIME MOBILE 5.64	130-160-135.7 FIXED MARITIME MOBILE RADIONAVIGATION 5.64
135.7-137.8 FIXED MARITIME MOBILE ADD Amateur ADD 5.XXX 5.64 5.67	135.7-137.8 FIXED MARITIME MOBILE ADD Amateur ADD 5.XXX 5.64	135.7-137.8 FIXED MARITIME MOBILE RADIONAVIGATION ADD Amateur ADD 5.XXX 5.64
137.8-148.5 FIXED MARITIME MOBILE 5.64 5.67	137.8-160 FIXED MARITIME MOBILE 5.64	137.8-160 FIXED MARITIME MOBILE RADIONAVIGATION 5.64

NOC (No Change)

5.64 Only classes A1A or F1B, A2C, A3C, F1C or F3C emissions are authorized for stations of the fixed service in the bands allocated to this service between 90 kHz and 160 kHz (148.5 kHz in Region 1) and for stations of the maritime mobile service in the bands allocated to this service between 110 kHz and 160 kHz (148.5 kHz in Region 1). Exceptionally, class J2B or J7B emissions are also authorized in the bands between 110 kHz and 160 kHz (148.5 kHz in Region 1) for stations of the maritime mobile service.

NOC (No Change)

5.67 *Additional allocation:* in Azerbaijan, Bulgaria, Mongolia, Kyrgyzstan, Romania, Turkmenistan and Ukraine, the band 130-148.5 kHz is also allocated to the radionavigation service on a secondary basis. Within and between these countries this service shall have an equal right to operate.

ADD (Addition/new)

5.XXX Stations in the amateur service using frequencies in this band shall not exceed a maximum radiated power of 1 W (e.i.r.p.) and

shall not cause harmful interference to stations of the radionavigation service operating in countries listed in provision 5.67.

Reasons: A secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz would harmonize on a worldwide basis the use of this band.

Advantages

A secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz would:

- same as Method A; and
- in order to simplify the Radio Regulations and halt the proliferation of footnotes, the Voluntary Group of Experts concluded that worldwide allocations should be by Table of Allocation entry rather than by footnote.

Disadvantages

None foreseen.

g. Regulatory and procedural considerations

The effective date of the footnote allocation (Method A) or Table of Frequency Allocation (Method B) could be immediately after close of the conference.

MALAYSIAN PRELIMINARY VIEW (1.15):

Malaysia therefore proposes that a second method (Method B) of satisfying this agenda item would be to add a new amateur secondary allocation entry in Article 5 for the band 135.7-137.8 kHz. This entry would be qualified with a footnote limiting the e.i.r.p. as is currently shown with the existing WP 8A text.

WP 6

(Mobile, Future WRC programs and other issues.)

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**WRC Agenda Items: 1.3, 1.4, 2, 4, 5, 6, 7.1 (status
ITU-R studies), 7.2**

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item:

Agenda Item 1.3: in accordance with Resolution 747(WRC 03), consider upgrading the radiolocation service to primary allocation status in the bands 9 000-9 200 MHz and 9 300-9 500 MHz and extending by up to 200 MHz the existing primary allocations to the Earth exploration-satellite service (active) and the space research service (active) in the band 9 500-9 800 MHz without placing undue constraint on the services to which the bands are allocated;

ISSUE:

Resolution 747(WRC-03) further resolves that, taking into account the results of ITU-R studies, WRC-07 consider:

- 1 the upgrading of the radiolocation service to a primary allocation in the bands 9 000-9 200 MHz and 9 300-9 500 MHz; and
- 2 the possible extension by up to 200 MHz of the allocation in the band 9 500-9 800 MHz to the EESS (active) and the space research service (active),

These allocations must ensure the protection of the incumbent services already allocated to these bands.

BACKGROUND:

There is a need to provide contiguous spectrum in the bands around 9 GHz for the radiolocation service allocated on a primary basis worldwide, in order to provide adequate spectrum for new radar systems to function. Emerging requirements for increased image resolution and increased range accuracy necessitate wider contiguous emission bandwidths than are currently available. Therefore, there is a need to upgrade the status of frequency allocations to the radiolocation service in the frequency range 9 000-9 200 MHz and 9 300-9 500 MHz in order for existing and planned radar systems to satisfy their required missions.

The bands 9 000-9 200 MHz and 9 300-9 500 MHz are allocated on a primary basis to Aeronautical radionavigation and Radionavigation, respectively. While radionavigation is recognized as a safety service as delineated in No. 4.10 of the Radio Regulations, radiolocation services have demonstrated compatible operations with radionavigation services in the bands 9 000-9 200 MHz and 9 300-9 500 MHz over many years through the use of similar system characteristics such as low-duty cycle emissions and scanning beams as well as interference reduction techniques. Previous and ongoing studies within the ITU R addressing

other frequency bands indicate that sharing in the bands 9 000-9 200 MHz and 9 300-9 500 MHz between the radionavigation and radiolocation services is likely to be feasible. It should be noted that Recommendation ITU R M.1313 contains the technical characteristics and protection criteria for maritime radars in the band 9 300-9 500 MHz and that Recommendation ITU R M.1372 identifies interference reduction techniques which enhance compatibility among radar systems. Further study is ongoing within the ITU-R to confirm the compatibility between the radiolocation and radionavigation services in these bands.

The band 9 500-9 800 MHz is allocated on a primary basis to the Earth exploration-satellite (EESS) (active), space research (active), radiolocation and radionavigation services, taking into account the constraints of footnote 5.476A. The allocation of this band to the EESS (active) and SRS (active) was decided by WRC-97 largely based on studies that were completed in ITU-R Joint Working Party 7-8R. In order to satisfy global environmental monitoring requirements for improved resolution, EESS (active) and the space research service (active) allocations require an increase by up to 200 MHz. There are plans to enhance synthetic aperture radars (SAR) that operate near 9.6 GHz to improve the spatial resolution to the order of 1 meter, which would require up to 500 MHz bandwidth. This additional bandwidth would greatly improve the resolution of the features for global monitoring and for environmental and land-use purposes.

Previous ITU-R studies have resulted in a number of pertinent Recommendations. Recommendation ITU-R SA.516 indicates the general feasibility of sharing between the EESS (active) and the radiolocation service for active sensors. Recommendation ITU-R SA.1166 contains the technical characteristics and protection criteria for Earth sensors operating near 9 500 MHz. Finally, Recommendation ITU-R SA.1280 addresses the selection of active spaceborne sensor emission characteristics to mitigate the potential for interference to terrestrial radars operating in frequency bands 1-10 GHz. Further study is ongoing to confirm the compatibility between EESS (active), SRS (active) and the incumbent services in the possible extension bands around 9 500-9 800 MHz.

MALAYSIA's PRELIMINARY VIEW (1.3):

Malaysia welcomes continued study in the effort to allow radiolocation service to be co-primary with the radionavigation service in the 9000 to 9200 MHz and 9300 to 9500 MHz bands. A strong positive conclusion to the study will enable administrators to

look favorably on the effort to make radiolocations co-primary in these bands.

The study on the sharing of EESS with the other services will be useful to determine the additional 200 MHz to add to the 9500 to 9800 MHz band.

Annex A:

ITU Allocation *

Frequency Band (MHz)	ITU Allocation		
	Region1	Region2	Region 3
900-9200		AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation 5.471	
9200-9300		RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.473 5.474	
9300-9500		RADIONAVIGATION 5.476 Radiolocation 5.427 5.474 5.475	
9500-9800		RADIOLOCATION RADIONAVIGATION SPACE RESEARCH (active) EARTH EXPLORATION-SATELLITE (active) 5.476A	

Malaysian Allocation *

* Malaysian Spectrum Plan – Jan 2005

Frequency Band (MHz)	Malaysian Allocation	Notes/Future use
9000-9200	AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation	For Aeronautical use.
9200-9300	RADIOLOCATION MARITIME RADIONAVIGATION 5.472 5.474	Band allocated for Maritime and Radiolocation
9300-9500	RADIONAVIGATION 5.476 Radiolocation 5.427 5.474 5.475	Band allocated for Radionavigation
9500-9800	RADIOLOCATION MLA4 RADIONAVIGATION SPACE RESEARCH (active) EARTH EXPLORATION-SATELLITE (active) 5.476A	MLA4: For exclusive use of the Government of Malaysia. Band allocated for Radar, sharing with EES.

Annex B

Current users of this band: -

Frequency band	Current Assignments
9000-9200 MHz	Operators: 1. KEMENTERIAN PERTAHANAN 2. PETRONAS PENAPISAN (MELAKA) SDN.BHD.
9300-9500 MHz	Operators: 1. KEMENTERIAN PERTAHANAN 2. PETRONAS PENAPISAN (MELAKA) SDN.BHD.

	3. NIPPON OIL EXPLORATION (M) LTD 4. EXXONMOBIL EXPLORATION AND PRODUCTION MALAYSIA 5. MAJLIS KESELAMATAN NEGARA 6. SARAWAK SHELL BERHAD
9500–9800 MHz	1. PETRONAS PENAPISAN (MELAKA) SDN.BHD.

Annex C

- 1) 5 year plan – continue to use subject to the completion of the study group reports
- 2) 5 to 15 year plan – continue to use subject to the outcome of the study group reports

Annex D – Other countries/groups position

APT Preliminary views

Upgrading of radiolocation

APT Administrations are of the view that the upgrading of radiolocation service to primary would be supported, subject to agreed ITU-R studies indicating that sharing with the radionavigation service is possible. These studies to be done by ITU-R needs to take into account measurement tests. It is also required that the radiolocation service operating in the 9 000-9 200 MHz and 9 300-9 500 MHz bands should not constrain the use and development of the radionavigation service, operating in accordance with the Radio Regulations. This could be accomplished by an appropriate footnote to protect the aeronautical radionavigation and radionavigation systems.

Extension of EESS and SRS

APT Members are of the view that they support ongoing ITU-R compatibility studies between the existing systems operating in the radiolocation and radionavigation services in the 9 300 – 9 500 MHz band and the spaceborne radar systems operating under EESS (active) and SRS (active). Any expansion of the EESS (active) and SRS (active) allocation beyond the band 9 500-9 800 MHz should be based on studying its demand for this service and ensure that the incumbent services are protected. Should an expansion be granted to the EESS (active) and SRS (active) to operate spaceborne radar, some APT Administrations consider at this time that the lower portion (9 300-9 500 MHz) are preferable due to the fact that the band 9 800-10 000 MHz, fixed systems are operating or planned to be operated in some APT Administrations. Necessary regulatory text will be required to ensure protection to incumbent services.

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item:

Agenda Item 1.4: to consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 taking into account the results of ITU-R studies in accordance with Resolution 228 (Rev.WRC-03); agenda

ISSUE:

Resolution 228 (Rev.WRC-03) invited the ITU-R to further study the technical and operational issues associated with the future development of IMT-2000 and systems beyond IMT-2000 and to develop reports and recommendations as required in time for WRC-07. In particular, the Resolution invited the ITU-R to:

- Report the results of studies on spectrum requirements and potential frequency ranges that take into account:
 - the evolving user needs, including the growth in demand for IMT-2000 services;
 - the evolution of IMT-2000 and pre-IMT-2000 systems through advances in technology;
 - the bands currently identified for IMT-2000;
 - the time-frame in which spectrum would be needed;
 - the period for migration from existing to future systems;
 - the extensive use of frequencies below those identified for IMT-2000 in No. 5.317A;
- And to conduct studies that consider:
 - the use of frequencies below those currently identified
 - the needs of developing countries, including the use of the satellite component of IMT-2000, for suitable coverage in these countries
 - the results of sharing and compatibility studies with services to which the potential bands are already allocated

BACKGROUND:

WARC-92 identified the 1885-2025 MHz and 2110-2200 MHz bands (230 megahertz of spectrum) allocated to the mobile service for possible use on a worldwide basis by administrations wishing to implement IMT-2000 systems in footnote 5.388. Additionally, WRC-2000 identified the 806-960 MHz band in footnote 5.317A and the 1710-1885 MHz and 2500-2690 MHz bands in footnote 5.384A for possible IMT-2000 use. Each administration would decide which portions of the identified bands to use for IMT-2000.

In Res. 228 WRC-2000 invited the ITU-R to continue studies on overall objectives, applications and technical and operational implementation for the future development of IMT-2000 and systems beyond. It was also invited to study spectrum requirements and potential frequency ranges suitable for the future development of IMT-2000 and systems beyond IMT-2000, and in what time frame such spectrum would be needed. Res. 228 also resolved that the future development of IMT-2000 and systems beyond are to be reviewed by WRC-07, taking into consideration the results of ITU-R studies presented to WRC-03. Those studies were not completed in time for WRC-03.

At WRC-03, Res. 228 was modified to invite the ITU-R to conduct and complete in time for WRC-07, the appropriate studies of technical and operational issues, including spectrum requirements and potential frequency ranges suitable for those systems and to develop appropriate Recommendations. This would enable any necessary action to be taken by WRC-07.

The need for the studies was driven by the perception that there may be a need for new spectrum to accommodate:

- the increasing demand for mobile services,
- the development of higher bandwidth technologies, and
- the potential to use mobile services to meet universal service requirements

WP8F of ITU-R is developing Reports on service types and spectrum requirements. It is also developing a Recommendation that evaluates suitable frequency ranges, and in what timeframe such spectrum would be needed. WP 8F is in the process of developing the spectrum calculation methodology for systems beyond IMT-2000 and a new Recommendation on a spectrum calculation methodology that takes into account current systems, 3G systems, and systems beyond 3G. The completion of this work by WP 8F is planned for March 2006, so that the studies and Recommendation can be presented to WRC-07 for appropriate action.

MALAYSIA's PRELIMINARY VIEW (1.4):

Malaysia welcomes the effort to identify new bands for the IMT2000 utilization in the future. These bands should address the efficiency of delivering the IMT2000 service to areas where population densities are low. The current technologies does not provide a cost effective solution to rural areas and villages and therefore addressing this should be a main consideration so that these services are available to the majority of the people

With the maturing of IMT2000 technologies, Malaysia hopes that a convergence of all high-speed wireless communication technologies can be looked at seriously and standardized at international level so that investment and procurement in these areas can be achieved with more confidence.

Annex A

Frequency Band (MHz)	ITU Allocation		
	Region1	Region2	Region 3
450-455	FIXED MOBILE 5.209 5.271 5.286 5.286A 5.286B 5.286C 5.286D 5.286E		
455-456	FIXED MOBILE 5.209 5.271 5.286A 5.286B 5.286C 5.286E	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209 5.286A 5.286B 5.286C	FIXED MOBILE 5.209 5.271 5.286A 5.286B 5.286C 5.286E
456-459	FIXED MOBILE 5.271 5.287 5.288		
459-460	FIXED MOBILE 5.209 5.271 5.286A 5.286B 5.286C 5.286E	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209 5.286A 5.286B 5.286C	FIXED MOBILE 5.209 5.271 5.286A 5.286B 5.286C 5.286E
460-470	FIXED MOBILE Meteorological-satellite (space-to-Earth) 5.287 5.288 5.289 5.290		

Frequency Band (MHz)	Malaysian Allocation	Notes/Future use
450-455	FIXED MLA27 MOBILE 5.209 5.286 5.286A MLA29	MLA27: Portion of the band may be used for Low Power Devices throughout Malaysia. MLA29: Portion of the band is sub-allocated for the various cellular phone services in Malaysia: ATUR 450, (E-TAC) 900, (AMPS/D.AMPS) 800, GSM 900 and GSM 1800 (previously known as PCN). All analogue services to be vacated by 2008.
455-456	FIXED MLA27 MOBILE 5.209 5.286A MLA29	MLA27: Portion of the band may be used for Low Power Devices throughout Malaysia. MLA29: Portion of the band is sub-allocated for the various cellular phone services in Malaysia: ATUR 450, (E-TAC) 900, (AMPS/D.AMPS) 800, GSM 900 and GSM 1800 (previously known as PCN). All analogue services to be vacated by 2008.
456-459	FIXED MLA27 MOBILE 5.287 MLA29 MLA30	MLA27: Portion of the band may be used for Low Power Devices throughout Malaysia. MLA29: Portion of the band is sub-allocated for the various cellular phone services in Malaysia: ATUR 450, (E-TAC) 900, (AMPS/D.AMPS) 800, GSM 900 and GSM 1800 (previously known as PCN). All analogue services to be vacated by 2008. MLA30: Portion of these bands 456.00MHz to 459.00MHz and 460.00MHz to 470.00MHz are used for walkie-talkie (point-to-point)
459-460	FIXED MLA27 MOBILE 5.209 5.286A MLA29	MLA27: Portion of the band may be used for Low Power Devices throughout Malaysia. MLA29: Portion of the band is sub-allocated for the various cellular phone services in Malaysia: ATUR 450, (E-TAC) 900, (AMPS/D.AMPS) 800, GSM 900 and GSM 1800 (previously known as PCN). All analogue services to be vacated by 2008.
460-470	FIXED MLA27 MOBILE Meteorological-satellite (space-to-Earth) 5.287 5.289 MLA29 MLA30	MLA27: Portion of the band may be used for Low Power Devices throughout Malaysia. MLA29: Portion of the band is sub-allocated for the various cellular phone services in Malaysia: ATUR 450, (E-TAC) 900, (AMPS/D.AMPS) 800, GSM 900 and GSM 1800 (previously known as PCN). All analogue services to be vacated by 2008. MLA30: Portion of these bands 456.00MHz to 459.00MHz and 460.00MHz to 470.00MHz are used for walkie-talkie (point-to-point)

Annex B

Current users of this band: -

Frequency band (MHz)	Current Assignments
452 – 456.465	Operators: 1. TELEKOM MALAYSIA BERHAD 2. SARAWAK SHELL BERHAD 3. SINGAPORE AIRLINES LIMITED 4. PETRONAS CARIGALI SDN BHD 5. PEJABAT PERDANA MENTERI MALAYSIA 6. MALAYSIAN AIRLINE SYSTEM BERHAD 7. NIKMAT MAJU DEVELOPMENT SDN.BHD. 8. MALAYSIA AIRPORTS SDN BHD 9. JURUKUR TEMPATAN SDN.BHD. 10. JOHOR PORT BERHAD 11. CABOT (MALAYSIA) SDN.BHD. 12. ASAL BARU SDN BHD 13. THE CORONADE HOTEL KUALA LUMPUR
462 – 466.475	Operators: 1. TELEKOM MALAYSIA BERHAD 2. PETRONAS CARIGALI SDN BHD 3. CMKS (MALAYSIA) SDN.BHD. 4. MOTOROLA MALAYSIA SDN BHD

Annex C

5 year plan – reform the frequency band 450 MHz for digital mobile service

5 to 15 year plan – to convert this band to IMT2000 band

Annex D

European countries position – to identify a band between 3 GHz and 6 GHz as a new IMT2000 band

African position – to identify a band below 800 MHz as an IMT2000 band

APT Preliminary Views

APT Administrations support the studies being conducted by ITU-R Study Groups regarding technical and regulatory aspects of the future development IMT-2000 and systems beyond IMT-2000 and on development of the methodology ensuring accurate calculation of spectrum requirements corresponding to the market demands of future mobile services.

The early identifications of frequency bands for future development of IMT-2000 and systems beyond IMT-2000 is necessary to make progress in the studies and to give administrations enough time to make frequency bands available for development of IMT-2000 and systems beyond IMT-2000 and it should preferably be identified by WRC-07.

The dates for the introduction of any new bands will depend on the demand for spectrum to support IMT-2000 and systems beyond IMT-2000 in each country as well as other conditions as referred to in Resolution 228 (Rev. WRC-03).

Additional spectrum for future development of IMT-2000 and systems beyond IMT-2000 should be harmonized globally to the greatest extent possible in order to facilitate global roaming, reduce cost of equipment manufacture and help developing countries to gain benefit from IMT-2000 and systems beyond IMT-2000.

Identification of frequency bands for future development of IMT-2000 and systems beyond IMT-2000 should take account of various elements referred to in Resolution 228 (Rev. WRC-03) such as cost-effective coverage of large areas of low population density, particularly for developing countries.

As a result, APT has the following preliminary views:

- Candidate frequency bands should be lower than 6GHz;
- Spectrum requirements for the future development of IMT-2000 and systems beyond IMT-2000 would be determined based on the result of calculations conducted by ITU-R Study Groups;

In determining the need for identifying additional spectrum, the following issues need to be fully recognized and duly taken into account:

- spectrum already identified for IMT-2000;
- the need to protect existing services, in particular, extensive use of these bands by terrestrial services other than terrestrial IMT-2000, including their evolution

Moreover, as indicated in Resolution 228, satellite can play a major role in developing countries and thus should also be duly considered and be taken into account in the evolution of IMT-2000 and systems beyond IMT-2000.

The APT administrations are encouraged to participate and review the study of ITU-R WP8F.

Annex E – study groups

Study on this issue by ITU-R WP8F is still ongoing

Annex F – Impact to the country

Depending on the take up of the 3G mobile service, the additional bands will be beneficial to the operators and the users if congestion occurs in the currently identified bands, especially within the city area. For the rural people, frequencies lower than 800 MHz will be advantageous to them because the long reach of these frequencies will enable operators to manage them profitably even if the population density is low.

WP 7

(Maritime Mobile Services.)

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Desk Officer;
Mohd Zaki Mohd Yusuff

Consultative Committee;
Ahmad Nordin Ibrahim (Marine Dept)

WRC Agenda Items: 1.14, 1.16

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item:

Agenda Item 1.14: to review the operational procedures and requirements of the Global Maritime Distress and Safety System (GMDSS) and other related provisions of the Radio Regulations, taking into account Resolutions 331 (Rev.WRC-03) and 342 (Rev.WRC-2000) and the continued transition to the GMDSS, the experience since its introduction, and the needs of all classes of ships;

ISSUE:

- Issue A

Resolution 331 (Rev.1 WRC-03) concerns the transition to the Global Maritime Distress and Safety System (GMDSS).

- Issue B

Resolution 342 (Rev. WRC-2000) invites the ITU-R to study new technologies to provide improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service.

There were many common elements in the input contributions and the meeting agreed to a preliminary view for both issues.

BACKGROUND:

Issue A: Sufficient experience has been gained from GMDSS, such that appropriate and/or necessary changes to the Radio Regulations could be considered by WRC-07.

The non-GMDSS distress and safety communications provisions should be gradually revised to accommodate interoperability with GMDSS. In particular, Chapter VII of the Radio Regulations should be revised. This interoperability is required to maintain compliance with Safety-Of-Life At Sea (SOLAS) until the maritime community has fully transitioned to the GMDSS standard. In accordance with IMO recommendations, GMDSS ships continue to keep continuous guard on VHF channel 16 (156.8 MHz) with a view to maintaining communications between SOLAS and Non-SOLAS ships. All vessels should be encouraged to make use of the GMDSS as soon as

possible. The IMO has authorized the discontinuance of a 2 182 KHz guard for SOLAS vessels. In recognition of continuing domestic requirements regarding non-SOLAS vessels outside of VHF range in some countries, a 2 182 kHz guard will need to be maintained for some time. Resolution 331 (Rev.WRC-03) should be modified to reflect the current situation. Rules and procedures for radiotelegraphy can be deleted from Appendix 13 along with relevant changes to Chapter IX.

Issue B: It is important that efficient use is made in the maritime VHF band for not only distress and safety communications but other digital communications and the demand for public correspondence. Therefore the introduction of digital systems and rearrangement of channel spacing is needed; but the further introduction of digital systems into this band should be based on adopting suitable technologies into a worldwide interoperable standard and be able to handle the existing system. Consequential revision of Appendix 18 to reflect these requirements and the worldwide decline of VHF public correspondence may be necessary at an appropriate time.

MALAYSIA's PRELIMINARY VIEW (1.14):

1. Malaysia supports the ongoing studies on the revision of the operational procedures and requirements of the Global Maritime Distress and Safety System (GMDSS).
2. Malaysia supports the efficient use is made in the maritime VHF band for other digital communications and the demand for public correspondence with regards to suitable technologies.

Malaysia
PRELIMINARY VIEWS ON WRC-07

WRC-2007 Agenda Item:

Agenda Item 1.16: to consider the regulatory and operational provisions for Maritime Mobile Service Identities (MMSIs) for equipment other than shipborne mobile equipment, taking into account Resolutions 344 (Rev.WRC-03) and 353 [COM4/4] (WRC-03);

ISSUE:

APT member countries present at APG2007-2 support the assignment of MMSIs to SAR aircraft and aids to navigation. However, a unique and entirely different format for these MMSIs should be developed and not impact on the MMSI numbers available for ship stations and coast stations. The registration of MMSIs assigned to SAR aircraft and aids to navigation in the Maritime Mobile Access and Retrieval System (MARS) is also supported. Support is also given to the completion of ITU-R studies to satisfy the requirements of Resolution 353 (WRC-03).

BACKGROUND:

The background information for this agenda item can be found in Document APG2007-2/8. Further background information can also be found in Documents APG2007-2/53 (J), APG2007-2/42 (IRN) and APG2007-2/23 (KOR)

Resolution 353 (WRC-03) resolves to invite ITU-R to review the MMSI operational and procedural requirements and to develop an appropriate format which cannot be confused with the format for ship and coast stations.

There were many common elements in the input contributions and the meeting agreed to a preliminary view.

MALAYSIA'S PRELIMINARY VIEW (1.16):

1. Malaysia supports the assignment of MMSIs to SAR aircraft and aids to navigation with a unique and different format for these MMSIs. In this case, there will be no duplication on the MMSI numbers for any Malaysian ship stations and coast stations.
2. Malaysia supports the registration of MMSIs assigned to SAR aircraft and aids to navigation in the Maritime Mobile Access and Retrieval System (MARS). Support is also given to the completion of ITU-R studies to satisfy the requirements of Resolution **353 (WRC-03)**.

Other matters

WRC Agenda Item: 1.1, 3

Country (Malaysia) Footnote in ITU RR-04

Agenda Item 1.1:

requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution **26 (Rev.WRC -97)**;

Note: Currently Malaysia has 10 country footnotes listed below:

1)

5.167 *Alternative allocation:* in Bangladesh, Brunei Darussalam, India, Indonesia, Iran (Islamic Republic of), ~~Malaysia~~, Pakistan, Singapore and Thailand, the band 50-54 MHz is allocated to the fixed, mobile and broadcasting services on a primary basis.

(2)

5.204 *Different category of service:* in Afghanistan, Saudi Arabia, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, China, Cuba, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Malaysia, Oman, Pakistan, the Philippines, Qatar, Serbia and Montenegro, Singapore, Thailand and Yemen, the band 137-138 MHz is allocated to the fixed and mobile, except aeronautical mobile (R), services on a primary basis (see No. **5.33**). (WRC-03)

(3)

5.221 Stations of the mobile-satellite service in the band 148-149.9 MHz shall not cause harmful interference to, or claim protection from, stations of the fixed or mobile services operating in accordance with the Table of Frequency Allocations in the following countries: Albania, Algeria, Germany, Saudi Arabia, Australia, Austria, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brunei Darussalam, Bulgaria, Cameroon, China, Cyprus, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Croatia, Cuba, Denmark, Egypt, the United Arab Emirates, Eritrea, Spain, Estonia, Ethiopia, the Russian Federation, Finland, France, Gabon, Ghana, Greece, Guinea, Guinea Bissau, Hungary, India, Iran (Islamic Republic of), Ireland, Iceland, Israel, Italy, the Libyan Arab Jamahiriya, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, The Former Yugoslav Republic of Macedonia, Lesotho, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mauritania, Moldova, Mongolia, Mozambique, Namibia, Norway, New Zealand, Oman, Uganda, Uzbekistan, Pakistan, Panama, Papua New Guinea, Paraguay, the Netherlands, the Philippines, Poland, Portugal, Qatar, the Syrian Arab Republic, Kyrgyzstan, Slovakia, Romania, the United Kingdom, Senegal, Serbia and Montenegro, Sierra Leone, Singapore, Slovenia, Sri Lanka, South Africa, Sweden, Switzerland, Swaziland, Tanzania, Chad, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Ukraine, Viet Nam, Yemen, Zambia, and Zimbabwe. (WRC-03)

(4)

5.262 *Additional allocation:* in Saudi Arabia, Armenia, Azerbaijan, Bahrain, Belarus, Bosnia and Herzegovina, Botswana, Bulgaria, Colombia, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, the Russian Federation, Georgia, Hungary, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kazakhstan, Kuwait, Liberia, Malaysia, Moldova, Uzbekistan, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, Kyrgyzstan, Romania, Serbia and Montenegro, Singapore, Somalia, Tajikistan,

Turkmenistan and Ukraine, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

(5)

5.276 *Additional allocation:* in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burkina Faso, Burundi, Egypt, the United Arab Emirates, Ecuador, Eritrea, Ethiopia, Greece, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Italy, Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Lebanon, Liechtenstein, Malaysia, Malta, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Switzerland, Tanzania, Thailand, Togo, Turkey and Yemen, the band 430-440 MHz is also allocated to the fixed service on a primary basis and the bands 430-435 MHz and 438-440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis. (WRC-97)

(6)

5.429 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, Congo (Rep. of the), Korea (Rep. of), the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kenya, Kuwait, Lebanon, ~~Malaysia~~, Oman, Pakistan, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea and Yemen, the band 3300-3400 MHz is also allocated to the fixed and mobile services on a primary basis. The countries bordering the Mediterranean shall not claim protection for their fixed and mobile services from the radiolocation service. (WRC-03)

(7)

5.447E *Additional allocation:* The band 5250-5350 MHz is also allocated to the fixed service on a primary basis in the following countries in Region 3: Australia, Korea (Rep. of), India, Indonesia, Iran (Islamic Republic of), Japan, Malaysia, Papua New Guinea, the Philippines, Sri Lanka, Thailand and Viet Nam. The use of this band by the fixed service is intended for the implementation of fixed wireless access systems and shall comply with Recommendation ITU-R F.1613. In addition, the fixed service shall not claim protection from the radio determination, Earth exploration-satellite (active) and space research (active) services, but the provisions of No. **5.43A** do not apply to the fixed service with respect to the Earth exploration-satellite (active) and space research (active) services. After implementation of fixed wireless access systems in the fixed service with protection for the existing radiodetermination systems, no more stringent constraints should be imposed on the fixed wireless access systems by future radiodetermination implementations. (WRC-03)

(8)

5.453 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, Egypt, the United Arab Emirates, Gabon, Guinea, Equatorial Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kenya, Kuwait, Lebanon, Madagascar, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Sri Lanka, Swaziland, Tanzania, Chad, Thailand, Togo, Viet Nam and Yemen, the band 5650-5850 MHz is also allocated to the fixed and mobile services on a primary basis. In this case, the provisions of Resolution **229 (WRC-03)** do not apply. (WRC-03)

(9)

5.468 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Burundi, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guyana, Indonesia, Iran (Islamic Republic of), Iraq, the Libyan Arab Jamahiriya, Jamaica, Jordan, Kenya, Kuwait, Lebanon, ~~Malaysia~~, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan,

Qatar, Syrian Arab Republic, the Dem. People's Rep. of Korea, Senegal, Singapore, Somalia, Swaziland, Tanzania, Chad, Togo, Tunisia and Yemen, the band 8500-8750 MHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

(10)

5.477 *Different category of service:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guyana, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Japan, Jordan, Kuwait, Lebanon, Liberia, Malaysia, Nigeria, Oman, Pakistan, Qatar, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Trinidad and Tobago, and Yemen, the allocation of the band 9800-10000 MHz to the fixed service is on a primary basis (see No. **5.33**). (WRC-03)

(11)

5.500 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Brunei Darussalam, Cameroon, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Madagascar, Malaysia, Mali, Malta, Morocco, Mauritania, Nigeria, Pakistan, Qatar, the Syrian Arab Republic, Singapore, Sudan, Chad and Tunisia, the band 13.4-14 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

(12)

5.505 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Botswana, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Korea (Rep. of), Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lesotho, Lebanon, Malaysia, Mali, Morocco, Mauritania, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Swaziland, Tanzania, Chad and Yemen, the band 14-14.3 GHz is also allocated to the fixed service on a primary basis. (WRC-03)

(13)

5.512 *Additional allocation:* in Algeria, Angola, Saudi Arabia, Austria, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Cameroon, Congo (Rep. of the), Costa Rica, Egypt, El Salvador, the United Arab Emirates, Eritrea, Finland, Guatemala, India, Indonesia, Iran (Islamic Republic of), the Libyan Arab Jamahiriya, Jordan, Kenya, Kuwait, Malaysia, Mali, Morocco, Mauritania, Mozambique, Nepal, Nicaragua, Oman, Pakistan, Qatar, Serbia and Montenegro, Singapore, Slovenia, Somalia, Sudan, Swaziland, Tanzania, Chad, Togo and Yemen, the band 15.7-17.3 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

(14)

5.524 *Additional allocation:* in Afghanistan, Algeria, Angola, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Costa Rica, Egypt, the United Arab Emirates, Gabon, Guatemala, Guinea, India, Iran (Islamic Republic of), Iraq, Israel, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Nigeria, Oman, Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, the Dem. People's Rep. of Korea, Singapore, Somalia, Sudan, Tanzania, Chad, Togo and Tunisia, the band 19.7-21.2 GHz is also allocated to the fixed and mobile services on a primary basis. This additional use shall not impose any limitation on the power flux-density of space stations in the fixed-satellite service in the band 19.7-21.2 GHz and of space stations in the mobile-satellite service in the band 19.7-20.2 GHz where the allocation to the mobile-satellite service is on a primary basis in the latter band. (WRC-2000)

(15)

5.536C In Algeria, Saudi Arabia, Bahrain, Botswana, Brazil, Cameroon, Comoros, Cuba, Djibouti, Egypt, United Arab Emirates, Estonia, Finland, Iran (Islamic Republic of), Israel, Jordan, Kenya, Kuwait, Lithuania, Malaysia, Morocco, Nigeria, Oman, Qatar, Syrian Arab Republic, Somalia, Sudan, Tanzania, Tunisia, Uruguay, Zambia and Zimbabwe, earth stations operating in the space research service in the band 25.5-27 GHz shall not claim protection from, or constrain the use and deployment of, stations of the fixed and mobile services. (WRC-03)

(16)

5.537A In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 27.5-28.35 GHz may also be used by high altitude platform stations (HAPS). The use of HAPS within the band 27.5-28.35 GHz is limited, within the territory of the countries listed above, to a single 300 MHz sub-band. Such use of 300 MHz of the fixed-service allocation by HAPS in the above countries is further limited to operation in the HAPS-to-ground direction and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems or other co-primary services. Furthermore, the development of these other services shall not be constrained by HAPS. See Resolution **145 (WRC-03)**. (WRC-03)

(17)

5.542 *Additional allocation:* in Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, Cameroon, China, Congo (Rep. of the), Egypt, the United Arab Emirates, Eritrea, Ethiopia, Guinea, India, Iran (Islamic Republic of), Iraq, Japan, Jordan, Kuwait, Lebanon, Malaysia, Mali, Morocco, Mauritania, Nepal, Pakistan, Philippines, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea, Somalia, Sudan, Sri Lanka and Chad, the band 29.5-31 GHz is also allocated to the fixed and mobile services on a secondary basis. The power limits specified in Nos. **21.3** and **21.5** shall apply. (WRC-2000)

(18)

5.543A In Bhutan, Korea (Rep. of), the Russian Federation, Indonesia, Iran (Islamic Republic of), Japan, Kazakhstan, Lesotho, Malaysia, Maldives, Mongolia, Myanmar, Uzbekistan, Pakistan, the Philippines, Kyrgyzstan, the Dem. People's Rep. of Korea, Sri Lanka, Thailand and Viet Nam, the allocation to the fixed service in the band 31-31.3 GHz may also be used by systems using high altitude platform stations (HAPS) in the ground-to-HAPS direction. The use of the band 31-31.3 GHz by systems using HAPS is limited to the territory of the countries listed above and shall not cause harmful interference to, nor claim protection from, other types of fixed-service systems, systems in the mobile service and systems operated under No. **5.545**. Furthermore, the development of these services shall not be constrained by HAPS. Systems using HAPS in the band 31-31.3 GHz shall not cause harmful interference to the radio astronomy service having a primary allocation in the band 31.3-31.8 GHz, taking into account the protection criterion as given in Recommendation ITU-R RA.769. In order to ensure the protection of satellite passive services, the level of unwanted power density into a HAPS ground station antenna in the band 31.3-31.8 GHz shall be limited to -106 dB(W/MHz) under clear-sky conditions, and may be increased up to -100 dB(W/MHz) under rainy conditions to take account of rain attenuation, provided the effective impact on the passive satellite does not exceed the impact under clear-sky conditions as given above. See Resolution **145 (WRC-03)**. (WRC-03)

(19)

5.549 *Additional allocation:* in Saudi Arabia, Bahrain, Bangladesh, Egypt, the United Arab Emirates, Gabon, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Jordan, Kuwait, Lebanon, Malaysia, Mali, Malta, Morocco, Mauritania, Nepal, Nigeria, Oman,

Pakistan, the Philippines, Qatar, the Syrian Arab Republic, the Dem. Rep. of the Congo, Singapore, Somalia, Sudan, Sri Lanka, Togo, Tunisia and Yemen, the band 33.4-36 GHz is also allocated to the fixed and mobile services on a primary basis. (WRC-03)

Agenda for the 2007 World Radiocommunication Conference RESOLUTION 802 (WRC-03)

1 on the basis of proposals from administrations, taking account of the results of WRC-03 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action with respect to the following items:

1.1 requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, in accordance with Resolution **26 (Rev.WRC -97)**;

1.2 to consider allocations and regulatory issues related to the Earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service in accordance with Resolutions **746 (WRC-03)** and **742 (WRC-03)**;

1.3 in accordance with Resolution **747 (WRC-03)**, consider upgrading the radiolocation service to primary allocation status in the bands 9 000-9 200 MHz and 9 300-9 500 MHz and extending by up to 200 MHz the existing primary allocations to the Earth exploration-satellite service (EESS) (active) and the space research service (SRS) (active) in the band 9 500-9 800 MHz without placing undue constraint on the services to which the bands are allocated;

1.4 to consider frequency-related matters for the future development of IMT-2000 and systems beyond IMT-2000 taking into account of the results of ITU-R studies in accordance with Resolution **228 (Rev.WRC -03)**;

1.5 to consider spectrum requirements and possible additional spectrum allocations for aeronautical telecommand and high bit-rate aeronautical telemetry, in accordance with Resolution **230 (WRC-03)**;

1.6 to consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, in accordance with Resolution **414 (WRC-03)** and, to study current satellite frequency allocations, that will support the modernization of civil aviation telecommunication systems, taking into account Resolution **415 (WRC-03)**;

1.7 to consider the results of ITU-R studies regarding sharing between the mobile-satellite service and the SRS (passive) in the band 1 668-1 668.4 MHz, and between the mobile-satellite service and the mobile service in the band 1 668.4-1 675 MHz in accordance with Resolution **744 (WRC-03)**;

1.8 to consider the results of ITU-R studies on technical sharing and regulatory provisions for the application of high altitude platform stations operating in the bands 27.5-28.35 GHz and 31-31.3 GHz in response to Resolution **145 (WRC-**

03), and for high altitude platform stations operating in the bands 47.2-47.5 GHz and 47.9-48.2 GHz in response to Resolution **122 (Rev.WRC -03)**;

1.9 to review the technical, operational and regulatory provisions applicable to the use of the band 2 500-2 690 MHz by space services in order to facilitate sharing with current and future terrestrial services without placing undue constraint on the services to which the band is allocated;

1.10 to review the regulatory procedures and associated technical criteria of Appendix **30B** without any action on the allotments, the existing systems or the assignments in the List of Appendix **30B**;

1.11 to review sharing criteria and regulatory provisions for protection of terrestrial services, in particular the terrestrial television broadcasting service, in the band 620-790 MHz from broadcasting-satellite service networks and systems, in accordance with Resolution **545 (WRC -03)**;

1.12 to consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: • gAdvanced publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks• h in accordance with Resolution **86 (WRC -03)**;

1.13 taking into account Resolutions **729 (WRC -97)**, **351 (WRC -03)** and **544 (WRC -03)**, to review the allocations to all services in the HF bands between 4 MHz and 10 MHz, excluding those allocations to services in the frequency range 7 000-7 200 kHz and those bands whose allotment plans are in Appendices **25**, **26** and **27** and whose channelling arrangements are in Appendix **17**, taking account of the impact of new modulation techniques, adaptive control techniques and the spectrum requirements for HF broadcasting;

1.14 to review the operational procedures and requirements of the Global Maritime Distress and Safety System (GMDSS) and other related provisions of the Radio Regulations, taking into account Resolutions **331 (Rev.WRC -03)** and **342 (Rev.WRC -2000)** and the continued transition to the GMDSS, the experience since its introduction, and the needs of all classes of ships;

1.15 to consider a secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz;

1.16 to consider the regulatory and operational provisions for Maritime Mobile Service Identities (MMSIs) for equipment other than shipborne mobile equipment, taking into account Resolutions **344 (Rev.WRC -03)** and **353 (WRC -03)**;

1.17 to consider the results of ITU-R studies on compatibility between the fixed-satellite service and other services around 1.4 GHz, in accordance with Resolution **745 (WRC -03)**;

1.18 to review pfd limits in the band 17.7-19.7 GHz for satellite systems using highly inclined orbits, in accordance with Resolution **141 (WRC -03)**;

1.19 to consider the results of the ITU-R studies regarding spectrum requirement for global broadband satellite systems in order to identify possible global harmonized fixed-satellite service frequency bands for the use of Internet applications, and consider the appropriate regulatory/technical provisions, taking also into account No. **5.516B**;

1.20 to consider the results of studies, and proposals for regulatory measures if appropriate regarding the protection of the EESS (passive) from unwanted emissions of active services in accordance with Resolution **738 (WRC-03)**;

1.21 to consider the results of studies regarding the compatibility between the radio astronomy service and the active space services in accordance with Resolution **740 (Rev.WRC-03)**, in order to review and update, if appropriate, the tables of threshold levels used for consultation that appear in the Annex to Resolution **739 (WRC-03)**;

2 to examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution **28 (Rev.WRC-03)**, and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex to Resolution **27 (Rev.WRC-03)**;

3 to consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;

4 in accordance with Resolution **95 (Rev.WRC-03)**, to review the Resolutions and Recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

5 to review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;

6 to identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;

7 in accordance with Article 7 of the Convention:

7.1 to consider and approve the Report of the Director of the Radiocommunication Bureau:

- on the activities of the Radiocommunication Sector since WRC-03;
- on any difficulties or inconsistencies encountered in the application of the Radio Regulations; and
- on action in response to Resolution **80 (Rev.WRC-2000)**;

7.2 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 **803 (WRC-03)**