



*Radiocommunication Bureau*  
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Administrative Circular  
CAR/232

12 December 2006

## To Administrations of Member States of the ITU

**Subject: Radiocommunication Study Group 8**

– **Proposed approval of 2 draft new Questions and 5 draft revised Questions**

At the meeting of Radiocommunication Study Group 8 held on 20 and 21 September 2006, 2 draft new Questions and 5 draft revised Questions were adopted and it was agreed to apply the procedure of Resolution ITU-R 1-4 (see § 3.4) for approval of Questions in the interval between Radiocommunication Assemblies.

Having regard to the provisions of § 3.4 of Resolution ITU-R 1-4, you are requested to inform the Secretariat ([brsgd@itu.int](mailto:brsgd@itu.int)) by 12 March 2007, whether your Administration approves or does not approve these Questions.

After the above-mentioned deadline, the results of this consultation will be notified in an Administrative Circular. If the Questions are approved, they will have the same status as Questions approved at a Radiocommunication Assembly and will become official texts attributed to Radiocommunication Study Group 8 (see: <http://www.itu.int/pub/R-QUE-SG08/en>).

Valery Timofeev  
Director, Radiocommunication Bureau

### **Annexes: 7**

– 2 draft new ITU-R Questions and 5 draft revised ITU-R Questions

#### Distribution:

- Administrations of Member States of the ITU
- ITU-R Associates participating in the work of Radiocommunication Study Group 8
- Radiocommunication Sector Members participating in the work of Radiocommunication Study Group 8

## ANNEX 1

Source: Document 8/169

### EVALUATION OF THE DRAFT NEW QUESTION IN ACCORDANCE WITH RESOLUTION ITU-R 51

This draft new Question is intended to initiate studies related to the technical and operational characteristics and spectrum requirements of high-frequency surface wave radar systems operating in the 3 to 50 MHz frequency range. There is an increasing interest in the ability to accurately measure the currents and waves in coastal waters and to maintain awareness of ships and aircraft for security purposes. High-frequency radar systems are currently operating on an experimental basis in various regions of the world. This draft new Question will help address the operational requirements of these radar systems as the oceanographic, meteorological, climatological and maritime communities consider deploying a global operational network of sea surface monitoring radars. Because of its relevance to the mandate of the ITU-R and considering that it is not being addressed elsewhere, this draft new Question complies with *resolves* 1a) and 1b) of Resolution ITU-R 51.

#### DRAFT NEW QUESTION ITU-R [RADAR 3-50 MHz]/8

#### **Technical and operational characteristics and spectrum requirements of high-frequency surface wave radar systems operating in the frequency range 3 to 50 MHz\***

The ITU Radiocommunication Assembly,

*considering*

- a) that there is a need to operate high-frequency ocean observing radar systems, in the radiodetermination service, using spectrum in the 3 to 50 MHz frequency range;
- b) that high-frequency surface wave radar systems have been operated in the 3 to 50 MHz range on an experimental basis for many years, and there is global interest in deploying operational systems on a worldwide basis;
- c) that low-power high-frequency surface wave radar systems include:
  - measurement of sea state and ocean currents for oceanographic, climatological and meteorological operations; and
  - maritime domain awareness beyond the range of detection of microwave radars, providing safety, tracking of surface vessels and aircraft and security of shipping and ports;

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\* This Question should be brought to the attention of the International Maritime Organization (IMO), the World Meteorological Organization (WMO) and ITU-R Study Groups 6, 7 and 9.

- d) that performance and data requirements dictate the operational characteristics that can be used by high-frequency surface wave ocean observing radar systems;
- e) that there is possibly a need for several frequency bands spread across the 3 to 50 MHz range,

*decides that the following Question should be studied*

- 1** What are the technical and operational characteristics of high-frequency surface wave radar systems operating in sub-bands in the frequency range 3 to 50 MHz?
- 2** What are the frequency bands most suitable, within 3 to 50 MHz, for operation of high-frequency surface wave radar systems, taking into account frequency dependent properties required for operation, and possible sharing issues with allocated radio services?
- 3** What techniques can be used by high-frequency surface wave radar systems to make the most efficient use of the spectrum and mitigate interference to existing services?

*further decides*

- 1** that the results of the above studies should be included in one or more Recommendations or Reports;
- 2** that the above studies should be completed by 2009.

Category: S2

## ANNEX 2

Source: Document 8/170

### EVALUATION OF THE DRAFT NEW QUESTION IN ACCORDANCE WITH RESOLUTION ITU-R 51

An evaluation of the proposed draft new Question has been conducted according to the guidelines in [Resolution ITU-R 51](#). The studies that need to be performed to answer this question are related to the conduct of radiocommunication matters, specifically pertaining to the efficient use of the radio-frequency spectrum in terrestrial radiocommunication, addressing in particular the characteristics and performance of radio systems. Furthermore, some aspects of cognitive radio<sup>1</sup> systems are already underway in various organizations throughout the world and the work in ITU-R is expected to be developed primarily by means of technical contributions from the member organizations, as well as by means of liaison with other entities, in accordance with [Resolution ITU-R 1-4](#), § 5.4, and [Resolution ITU-R 9-2](#) as required.

#### DRAFT NEW QUESTION ITU-R [8A/CR]/8

#### **Cognitive radio systems in the mobile service<sup>2</sup>**

The ITU Radiocommunication Assembly,

*considering*

- a) that the use of mobile radio systems is growing at a rapid rate globally;
- b) that more efficient use of spectrum is essential to the continued growth of such systems;
- c) that cognitive radio systems may facilitate the more efficient use of spectrum in mobile radio systems;
- d) that cognitive radio systems may offer functional and operational versatility and flexibility in mobile radio systems;
- e) that considerable research and development is being carried out on cognitive radio systems and related radio technologies;
- f) that the implementation of cognitive radio systems may include technical and regulatory issues, and it is beneficial to identify the technical and operational characteristics;

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<sup>1</sup> A cognitive radio system is a system that has the capability to sense and be aware of its operational environment, to be trained to dynamically and autonomously adjust its radio operating parameters accordingly and to learn from the results of its actions and environmental usage patterns.

<sup>2</sup> This Question should be brought to the attention of Study Groups 1, 4, 6 and 9.

g) that Reports and/or Recommendations on cognitive radio systems would be complementary to other ITU-R Recommendations on mobile radio systems,

*noting*

that there are network aspects related to the control of cognitive radio systems,

*decides* that the following Question should be studied

- 1 What is the ITU definition of cognitive radio systems?
- 2 What are the closely related radio technologies (e.g. smart radio, reconfigurable radio, policy-defined adaptive radio and their associated control mechanisms) and their functionalities that may be a part of cognitive radio systems?
- 3 What key technical characteristics, requirements, performance and benefits are associated with the implementation of cognitive radio systems?
- 4 What are the potential applications of cognitive radio systems and their impact on spectrum management?
- 5 What are the operational implications (including privacy and authentication) of cognitive radio systems?
- 6 What are the cognitive capabilities that could facilitate coexistence with existing systems in the mobile service and in other radiocommunication services, such as broadcast, mobile satellite or fixed?
- 7 What spectrum-sharing techniques can be used to implement cognitive radio systems to ensure coexistence with other users?
- 8 How can cognitive radio systems promote the efficient use of radio resources?

*further decides*

- 1 that the results of the above studies should be included in one or more Recommendations and/or Reports;
- 2 that the above studies should be completed by the year 2010.

NOTE 1 – The material developed during the above studies may be appropriate for inclusion in a Handbook.

Category: S2

## ANNEX 3

Source: Document 8/135

### DRAFT REVISION OF QUESTION ITU-R 109/8\*

#### **Global Maritime Distress and Safety System requirements for mobile-satellite systems operating in the bands 1 530-1 544 MHz and 1 626.5-1 645.5 MHz**

(1992)

The ITU Radiocommunication Assembly,

*considering*

- a) that the requirements for the Global Maritime Distress and Safety System (GMDSS) entered into force on 1 February 1992 in accordance with the 1988 Amendments to the 1974 International Convention for the Safety of Life at Sea (SOLAS) concerning radiocommunications for the GMDSS;
- b) that multiple mobile-satellite systems designed for operation in the 1 530-1 544 MHz and 1 626.5-1 645.5 MHz bands are currently being developed and introduced;
- c) that the 1 530-1 544 MHz and 1 626.5-1 645.5 MHz bands, used for GMDSS distress and safety communications (see Table 15-2 of Appendix 15 to the Radio Regulations), are also available for other services;
- d) that currently the International ~~Mobile-Satellite~~ Maritime Organization (IMSO) ~~participates in~~ has recognized only one provider of mobile-satellite communications (Inmarsat) for the GMDSS in these bands;
- e) that if multiple mobile-satellite systems operate in these bands, not all may elect to participate in the GMDSS;
- f) that ~~the IMSO system~~, as a major element of the GMDSS, the satellite system provides for priority processing of distress alerts from ship earth stations to the coast earth stations;
- g) that ~~IMSO~~ coast earth stations provide for expeditious handling and delivery of distress messages to their associated rescue coordination centres;
- h) that, in these frequency bands, distress and safety receives the highest order of priority of communications in the maritime mobile-satellite service;
- j) that, in these frequency bands, any emission causing harmful interference to maritime mobile-satellite distress and safety communications is prohibited;
- k) that satellite systems participating in the GMDSS may provide a number of telecommunication services not associated with the GMDSS;

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\* This Question should be brought to the attention of the International Maritime Organization (IMO), ~~the International Mobile Satellite Organization (IMSO)~~, the International Civil Aviation Organization (ICAO) and the Telecommunication Standardization Bureau.

- l) that use of these bands for distress and safety purposes in the maritime mobile-satellite service is an important part of the GMDSS;
- m) that implementation of these telecommunication services under the GMDSS has ~~been~~ ongoing for some time,

*decides* that the following Question should be studied

- 1** What percentages of the total number of ship earth stations may be expected to be simultaneously conducting distress and safety communications in the GMDSS in the various oceanic areas and what traffic studies should be undertaken to assure the required grade of safety service?
- 2** What should the technical and operational characteristics be for mobile-satellite systems operating in the 1 530-1 544 MHz and 1 626.5-1 645.5 MHz bands in relation to distress and safety communications in the GMDSS?
- 3** What techniques including real-time pre-emption or the use of dedicated channels can be used to provide the necessary protection and priority access for maritime mobile service distress and safety communications in these bands?
- 4** What inter-system and intra-system protection criteria should be established for mobile satellite systems operating in these bands?

*further decides*

- 1** that the results of the above studies should be included in (a) Recommendation(s);
- 2** that the above studies should be completed before ~~2005~~2007.

Category: S1

## ANNEX 4

Source: Document 8/136

### DRAFT REVISION OF QUESTION ITU-R 210/8

#### **Technical characteristics for mobile Earth stations operating with global non-geostationary-satellite systems in the mobile-satellite service in the band 1-3 GHz**

(1995)

The ITU Radiocommunication Assembly,

*considering*

~~a) that WARC 92 has allocated new frequency bands in the range 1-3 GHz for the mobile-satellite services (MSS);~~

~~b~~a) that various technically-different global non-geostationary-satellite systems in the MSS (non-GSO MSS systems) have commenced operating around the end of the 1990s;

~~e~~b) that mobile earth stations are expected to operate with these global non-GSO MSS systems in various countries;

~~d~~c) that the identification by ITU-R of technical characteristics of mobile earth stations operating with different MSS systems would provide a common technical basis for facilitating equipment approval by various national authorities;

~~e~~d) that this identification of technical characteristics could facilitate the development of agreements between administrations regarding the operation of these mobile earth stations;

~~f~~e) that transparency of the technical characteristics of mobile earth stations promotes the introduction of the MSS service;

~~g~~f) that national/regional standardization bodies may work for the establishment of technical standards for mobile earth stations;

~~h~~g) that technical requirements for MSS mobile earth stations described in ITU-R Recommendations should be kept to a minimum to avoid unnecessary restrictions on the technical development of these mobile earth stations,

*decides* that the following Question should be studied

What are suitable technical characteristics of mobile earth stations operating with global non-GSO MSS systems?

*further decides*

1 that the results of the above studies should be included in one or more Recommendations;

2 that the above studies should be completed by ~~2005~~2007.

Category: S1



## ANNEX 5

Source: Document 8/137

### DRAFT REVISION OF QUESTION ITU-R 84-3/8\*

#### Use of non-geostationary-satellite orbits in mobile-satellite services

(1988-1990-1992-1993)

The ITU Radiocommunication Assembly,

*considering*

- a) that various types of non-geostationary-satellite orbits can provide global coverage within latitudes between the 90° parallels utilizing configurations suitable for a variety of satellite communication applications;
- b) that ~~Resolution 46 (Rev. WRC-97) calls for studies~~ should continue to be carried out in the ITU-R to establish guidelines for sharing within the mobile-satellite service (MSS), and between MSS and other services;
- c) that use of orbits other than geostationary for some mobile-satellite applications could provide better coverage for areas above ~~70°~~ certain latitudes and in general provide improved services because of shorter path links and also facilitate joint use with other services, e.g., the radiodetermination services;
- d) that elevation angles to the geostationary orbit are very low from higher latitudes which accentuates the communication problems caused by multipath and shadowing effects. The use of orbits other than geostationary may improve this situation;
- e) that such systems operating in different frequency bands may have distinctly different characteristics,

*decides* that the following Question should be studied

- 1 What types of non-geostationary-satellite orbits are suitable for providing mobile-satellite services?
- 2 What are the technical and operational advantages and limitations of those non-geostationary-satellite orbits, and the systems utilizing them?
- ~~3 What are the most suitable frequency bands for non-geostationary satellites and what frequency coordination aspects need to be addressed?~~
- 4~~3~~ Subsequently to the studies in accordance with *decides* 1 to 3, what ~~standards~~ technical specifications should be provided to meet the objective of ~~§~~ considering c)?

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\* This Question should be brought to the attention of Radiocommunication Study Groups 4, 7 and 9.

*further decides*

- 1 that the results of the above studies should be included in (a) Recommendation(s);
- 2 that the above studies should be completed by ~~2005~~2007.

Category: S2

## ANNEX 6

Source: Document 8/138

### DRAFT REVISION OF QUESTION ITU-R 87-3/8\*

#### **Transmission characteristics for a mobile-satellite communication system**

(1988-1990-1992-1993)

The ITU Radiocommunication Assembly,

*considering*

~~a) Resolution No. 44 (Mob 87) of the World Administrative Radio Conference for the Mobile Services (Geneva, 1987) (WARC MOB-87);~~

~~b) that currently the International Mobile-Satellite Maritime Organization (IMSO/IMO) provides international has recognized only one provider of mobile-satellite communications (Inmarsat) and other organizations plan to offer international or domestic mobile-satellite services for the GMDSS;~~

~~b) that other organizations offer or plan to offer international or domestic mobile-satellite services;~~

~~e) that digital communication techniques are being proposed for the mobile-satellite service and can provide efficient use of limited bandwidth and powers, and would support a wide variety of voice, data and message communication services;~~

~~c) that modulation techniques and systems should be robust under fading and shadowing conditions;~~

~~d) that the efficiency of orbit-spectrum utilization in mobile-satellite systems will be determined in part by the technical characteristics employed, such as modulation methods and parameters, impact of frequency reuse techniques or the arrangement of radio-frequency carriers;~~

~~f) that studies are made by the ITU-T from the viewpoints of interconnection of radio systems with public telecommunication networks;~~

*decides* that the following Question should be studied

**1** What are the preferred transmission characteristics for the following systems:

**1.1** land mobile-satellite systems;

**1.2** maritime mobile-satellite systems, including GMDSS;

**1.3** aeronautical mobile-satellite systems;

**1.4** mobile-satellite systems incorporating a combination of two or more of the above systems?

**2** What are the technically preferred multiple access, modulation and coding methods for such systems?

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\* This Question should be brought to the attention of the International Maritime Organization (IMO).

3 What are the preferred performance characteristics of earth stations and space stations for such systems?

4 What transmission characteristics could be common to facilitate compatibility between the land, maritime, and aeronautical mobile-satellite services?

*Further decides*

1 that the results of the above studies should be included in one or more Recommendation(s);

2 that the above studies should be completed by 2007.

Category: S2

## ANNEX 7

Source: Document 8/171

### DRAFT REVISION OF QUESTION ITU-R 96-1/8\*

#### **Improved efficiency in the use of the band 156-174 MHz by stations in the maritime mobile service with a view to enhancing maritime safety and port security**

(1990-1997)

The ITU Radiocommunication Assembly,

*considering*

a) ~~Recommendation 318 (Mob-87);~~

~~ba)~~ that the VHF radio spectrum available for use by the maritime mobile service is limited and that significant congestion exists in many parts of the world;

eb) that existing and new technologies different from those currently employed in the maritime mobile service may enable more efficient use of the available spectrum and accommodate foreseen future growth;

~~ec)~~ that the introduction and implementation of new technologies ~~should be based on~~will change how current well-defined long-term service-, technical- and operational-requirements maritime safety and port security requirements are defined;

ed) that the introduction and implementation of new technologies may have a considerable economical impact on the maritime community;

~~fe)~~ that Recommendation ITU-R SM.1046 defines a procedure for assessing spectrum utilization efficiency;

f) that the Automatic Identification System (AIS), as described in Rec. ITU-R M.1371, is designed for use aboard ships and at coast stations to improve maritime safety, port security and efficiency of navigation, and to help protect the marine environment;

g) that the installation and use of AIS equipment is required under the International Convention on Safety of Life at Sea (SOLAS) aboard ships engaged in international commerce of 300 gross tonnage or more;

h) that there exists an emerging need to detect and identify ships at sea at larger distances from coastlines than can be accomplished by normal terrestrial-based communications systems;

j) that satellite detection of AIS messages using low-orbiting satellites may offer a means of detecting and identifying ships equipped with AIS at any location on the Earth;

k) that the frequencies used by AIS are shared worldwide on a primary basis with other fixed and mobile radiocommunications services;

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\* This Question should be brought to the attention of the International Maritime Organization (IMO).

l) that the IMO Subcommittee on Radiocommunications and Search and Rescue (COMSAR 10/6) has noted that further study was needed on the questions of an additional AIS channel for satellite detection, and the means for ensuring that adequate protection could be afforded to AIS channels designated for the detection of AIS,

*decides* that the following Question should be studied

- 1 What are the ~~long-term maritime service requirements~~ maritime mobile service's long-term maritime safety and port security requirements?
- 2 What would be the impact of the implementation of these requirements on existing VHF communications?
- 3 What improvement in spectrum utilization and operational capabilities can be achieved by use of various new radio technologies or techniques in the VHF maritime mobile service?
- 4 What technical and operational characteristics should be recommended for international application?
- 5 What impact will such technologies or techniques have on the existing VHF maritime or other co-channel service arrangements?
- 6 Which transition scenarios would be appropriate to introduce and implement any new technology in the current VHF-band and what would be the impact on distress and safety communication in the VHF-band?
- 7 What are the factors that describe the technical feasibility and operational limitations of satellite detection of AIS messages using low-orbiting satellite technology?
- 8 What are the relevant technical factors and constraints for satellite detection of AIS messages due to sharing with other radiocommunications services?
- 9 What are the spectrum options to overcome any identified technical limitations or spectrum sharing constraints of satellite detection of AIS messages, including possible identification of a third channel accessible to AIS equipment that can be dedicated to satellite detection?

*further decides*

- 1 that the results of these studies should be included in one or more Recommendations;
- 2 that the above studies should be completed by 2005<sup>9</sup>\*\* .

Category: S2

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\*\* The completion of Recommendations which answer this Question should not delay the development of shipborne Automatic Identification Systems (AIS) now being prepared in IMO.