Agenda Item 4: **Assessment of operational requirements to determine the implementation of improvements in communication, navigation and surveillance (CNS) capabilities for operations in route and terminal area**

ICAO CMR 2015 RESULTS

(Presented by the Secretariat)

SUMMARY

This working paper presents information on the results of the Radio Navigation Conference (CMR) 2015 of the International Communications Union (UIT) carried out in Geneva, Switzerland, from 2 to 27 November 2015, regarding Agenda Item 1.1: *To consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution 233 (WRC-12).*

References:

- Report of the Nineteenth Meeting of the REDDIG Coordination Committee (RCC/19) (Lima, Peru, 7-9 March 2016);
- Information Paper 01 of the Second Meeting of the FSMP Working Group (Montreal, Canada, 15 to 19 February 2016).

ICAO strategic objectives:	*A – Safety* *B – Air navigation capacity and efficiency*

1. Introduction

1.1 The radio frequency spectrum is a finite and limited resource for which demand increases steadily. The needs of civil aviation as well as the other users of the spectrum continue to increase at an accelerated pace, which creates a more intense pressure with respect to this already meager resource. International competition between radiocommunication services requires all users of the spectrum, both aeronautical and non-aeronautical, to defend and justify, continuously, the retention of the existing frequency bands or the addition of new bands.

1.2 The posture of the ICAO in the CMR conferences, held approximately every four years, aims to protect the aeronautical spectrum for all systems of radiocommunication and radionavigation using facilities on ground and on board.

1.1 The UIT Radio Navigation Conference 2015 was conducted in Geneva, Switzerland, from 2 to 27 November 2015. The working teleconference was attended by 3800 participants from 162 UIT Member States and 130 from other entities including international organizations and industry.

2. **Analysis**

2.1 The demand for spectrum for mobile and broadband applications is growing at a fast pace. In this respect, the telecommunications industry was seeking up to 1 200 MHz of additional spectrum in the 300 MHz to 6 GHz range for International Mobile Telecommunications (IMT). This frequency range includes a number of aeronautical frequency bands and several of these were examined by the Conference for a potential allocation to IMT, including 2 700 – 2 900 MHz used by aeronautical primary surveillance radar (PSR) and 4.4 – 4.5 GHz which is adjacent to the aeronautical radio altimeter band at 4.2 – 4.4 GHz. The aeronautical radio altimeters constitute a critical component of the aircraft ground proximity warning system (GPWS) and are used during CAT I/II/III landings.

2.2 While ITU studies before the Conference pointed out that it is not possible to share the bandwidth between the PSR and the IMT, ITU had not made any study to analyse the compatibility of adjacent band between the IMT and the radio altimeters. ICAO Studies by the (FSMP) group of the ACP panel before the Conference indicated a strong potential for interference in the radio altimeters by the IMT. Relatively early during the Conference an agreement was reached to have bands of the PSR out of consideration. However the bands 4.4 - 4.5 GHz, adjacent to the band's radio altimeter was not considered off the table until the final days of the Conference.

2.3 A favourable outcome was secured for the C-band (3.4 – 4.2 GHz), used for satellite links in the Fixed Satellite Service (FSS) supporting aeronautical ground-ground communications, using very small aperture terminal (VSAT) equipment, especially in Africa (Agenda Item 9.1.5 also refers) and South/Central America. The conference made no new allocations or identifications for IMT between 3.7 and 4.2 GHz. In the remainder of the C-band (less critical for aviation VSATs), the conference specified necessary conditions to protect the FSS.

2.4 The frequency band for the RF signal reception for the REDDIG II is from 3400 to 4200 Mhz band. Specifically, the following carriers frequencies and their respective bandwidth are used:

- ✓ F1: 3789.496Mhz BW : 1.75Mhz
- ✓ F2: 3791.246 Mhz BW : 1.75Mhz
- ✓ F3: 3792.56200 BW : 0.875Mhz

2.5 The total occupation of the REDDIG II reception bandwidth goes from frequency 3788.621 to frequency 3.792.9995.

2.6 Likewise, other VISAT networks for aeronautical use are been operated in Argentina, Brazil, Colombia, Ecuador, Paraguay, Peru and Venezuela from 3400 to 4200 Mhz band.

2.7 From States that reported the operating frequency, Paraguay and Peru are within the protected band while Venezuela the operating frequency is in the section of the (3.4-3.7 Ghz) band which allowed bandwidth allocation to the IMT provided this service does not interfere with the service of the FSS. So there is such protection it is important to have registered in the national entity that manages the spectrum, frequencies and equipment of the FSS for aeronautical applications.

2.8 The CRCC/19 Meeting proceeded to follow-up the implementation of Conclusion RCC18/1 - *Registration process at the national entities that manage the spectrum, of the REDDIG II equipment and frequencies* in which States that still have not complete the process of registration of frequencies and equipment at the entities that manages the national frequencies spectrum, were requested to carry out the procedure not later than 29 May 2015 forwarding a copy of registration forms to ICAO

SAM Office by 12 June 2015, and those States that have already 2015 registered REDDIG II frequencies and equipment send a copy of the equipment send a copy of the forms by 31 March 2015.

2.9 As follow-up to Conclusion RCC/18.1, only Argentina and Chile presented their registration forms and the approval reply by the entity that manages the spectrum. Brazil reported that the process for registration of frequencies of REDDIG II is being made in conjunction with the registration process at all frequencies of aeronautical equipment installed in the country. Colombia reported that their registration process has not begun yet and would proceed once the relocation of Bogotá node REDDIG II is completed as well as the installation of its new national VSAT network which is in phase of implementation. France shall inform promptly to ICAO SAM Office if the registration process has been carried out. Paraguay reported that had proceeded to the registration of frequencies and equipment in same way as Peru, Trinidad & Tobago, Uruguay and Venezuela. In this regard the Secretariat requested these States to send as soon as possible to the ICAO SAM Office copy of the registration form in respect to the frequencies.

2.10 The RCC/19 considered that to ensure the protection of frequencies of REDDIG II and national satellite networks used for aeronautical applications, it is essential that States through their respective national entities that manage the frequency spectrum, register their VSAT stations to the MIFR (Master International Frequency Register). In this sense, REDDIG II focal points should ensure that the international registration process is made. In this respect, the Meeting formulated the following conclusion: Conclusion RCC/19-3 – Registration of VSAT stations for fixed-satellite service (FSS) for aeronautical use at MIFR (Master International Frequency Register).

2.11 It is expected that during this Meeting, States that have not register yet their frequencies, REDDIG II equipment and VSAT national stations for aeronautical use, if any, at the national entities that manages the radiofrequencies spectrum, report their progress made in this regard. Likewise inform SAM Office if national entities have proceed to register the operation frequencies of REDDIG II stations as well as the VISAT networks for local aeronautical use if any, at the UIT MIFR.

3 Suggested action

3.1 The Meeting is invited to:

a) Take note of the information provided;

b) analyse the results of the UIT CMR 15 and the corresponding actions regarding 1.1 to protect the fixed satellite service (FSS) system for aeronautical use as REDDIG II VSAT stations and other VISAT stations from national networks for aeronautical use; and

c) analyse any other aspect deemed necessary regarding this Agenda Item.