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ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 30: Aviation Safety and Air Navigation Policy

30.3 Relevant Outcomes of the High-level Conference on COVID-19, Safety Stream (HLCC 2021)

EXPERIENCE OF THE SULTANATE OF OMAN IN 5G DEPLOYMENT AND AVIATION SAFETY

(Presented by Oman)

EXECUTIVE SUMMARY

In accordance with an ongoing initiative by the International Civil Aviation Organization (ICAO) to ensure continued public and aviation safety, Oman has implemented regulatory and operational measures to mitigate possible interference to radio altimeters from 5G Networks.

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| <i>Strategic Objectives:</i> | This working paper relates to the Safety Strategic Objective. |
| <i>Financial implications:</i> | N/A |
| <i>References:</i> | ICAO State Letter: SP 74/1-21/22: <i>Potential safety concerns regarding interference to radio altimeters</i> High-level Conference on COVID-19 (HLCC 2021) Report MIDANPIRG/19 and RASG-MID/9 Report Doc 9718, <i>Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including Statement of Approved ICAO Policies</i> , Volume I – ICAO spectrum strategy, policy statements and related information |

1. INTRODUCTION

1.1 The Radio altimeter is a mandated safety-critical aircraft system used to determine an aircraft's height above terrain. It is the only sensor onboard the aircraft capable of providing a direct measurement of the clearance height above the terrain and obstacles.

1.2 A number of states are currently considering or have already begun deploying new cellular broadband technologies (such as 5G) in the frequency bands close to the radio altimeter's frequencies of operation (4.2-4.4 GHz), a critical aviation safety system.

1.3 The High-level Conference on COVID-19 (HLCC 2021) Recommendation 5/5 - *Mitigating the risk of 5G implementation to safety-critical radio altimeter functions*

That States:

- a) consider, as a priority, public and aviation safety when deciding how to enable cellular broadband/5G services;
- b) consult with aviation safety regulators, subject matter experts and airspace users, to provide all necessary considerations and regulatory measures to ensure that incumbent aviation systems and services are free from harmful interference; and

That ICAO:

- c) continue coordinated aviation efforts, particularly at the International Telecommunication Union (ITU), to protect radio frequency spectrum used by aeronautical safety systems.

1.4 The MIDANPIRG/19 meeting (14 to 17 February 2022) recalled that ICAO issued State Letter Ref.: SP 74/1-21/22, dated 25 March 2021, on the potential impact of the 5G on Radio Altimeter. Potential 5G interferences was acknowledged as a safety concerns and potential operational impacts on the Radio Altimeter.

2. ACTIONS TAKEN BY OMAN

2.1 5G Deployment

2.1.1 In the World Radiocommunication Conference (WRC-15), the band 3.4–3.6 GHz was identified for International Mobile Telecommunication (IMT) for the entirety of regions 1 and 2 and for eleven Region 3 countries, and the band 3.6-3.7 GHz was identified for IMT in four Region 2 countries, outlined in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718 Volume I).

2.1.2 The 5G network has been officially launched in the country by Oman Telecommunications Company (Omantel) in December 2019. The band 3.4 - 3.6 GHz is currently used for the deployed 5G network by the telecommunication operators in Oman.

2.2 **Actions of the Civil Aviation Authority**

2.2.1 In July 2021, CAA of Oman has issued a Safety Alert to raise awareness of the potential risk of 5G interference and to recommend precautionary operational measures before confirmation of impact of 5G radio waves on radio altimeters.

<https://www.caa.gov.om/upload/files/Safety%20Circular%2005%20Potential%20Safety%20Concerns%20regarding%20interference%20to%20radio%20altimeters.pdf>

2.2.2 Therefore, recommended actions for consideration by the aviation industry:

- a) operators shall remind passengers and flight crew that all electronic devices are either carried in the cabin, (on person) or in the luggage. If these are placed in checked baggage, they shall be turned off and protected from accidental activation;
- b) all 5G PED's carried in the aircraft shall be set to non-transmitting mode so they do not transmit on the cellular networks (e.g., flight mode) or switched off. For essential communications, e.g., for Emergency Medical Service operations (EMS), crew should only use 3G or 4G communication devices;
- c) in the event of an actual disturbance of radio altimeter, it is imperative that flight crew report the event to the Air Traffic Unit (ATU) as soon as possible.
- d) all Oman operators shall report to Flight Safety Department and Air Traffic Services Unit (ATSU) on any 5G interference with Radio Altimeter readouts; and
- e) international operators need to be aware of the potential risk of interference to radio altimeters when operating in countries with different 5G networks and their respective mitigations measures, if there is any 5G interferences with radio altimeter observed in Oman report to Air Traffic Services Unit (ATSU).

2.2.3 CAA of Oman works jointly and in cooperation with the Telecommunication Regulatory Authority (TRA) of Oman to monitor industry complaints or reported occurrences due to interference to radio altimeter, as well as any relevant updates in this regard.

3. **CONCLUSION**

3.1 The Assembly is invited to note the successful experience of Oman to mitigate possible interference to radio altimeters from 5G Networks.

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