

## ***SAFETY INFORMATION 2/2022***

*20 January 2022*



### ***POTENTIAL SAFETY RISK OF INTERFERENCE TO AIRCRAFT ALTIMETER BY 5G TELECOMMUNICATIONS SYSTEM***

#### **Introduction**

The purpose of this Civil Aviation Safety Information is to raise awareness among aircraft operators on the potential safety risk of interference from 5G telecommunication networks and to recommend precautionary operational measures by operators. Studies and assessment on this issue are currently ongoing to obtain a more definitive understanding on the impact and risk involved.

#### **Reference**

1. ICAO state letter SP 74/1-21/22 dated 25 March 2021
2. FAA Special Airworthiness Information Bulletin (SAIB): AIR-21-18 dated 02 November 2021

#### **Background**

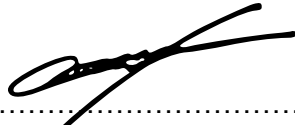
While several countries around the world have deployed the 5G networks, there have been potential safety concerns expressed at the global level as the 5G frequency operating in the C-band in the range of 3.7 – 3.98 GHz could potentially interfere with the normal operation of aircraft radio altimeter systems operating at 4.2 to 4.4 GHz. However, in Malaysia, the C-band for the 5G is in the range from 3.4 – 3.6 GHz with a broader guard band. Malaysia's 5G frequency separation in the C-band is similarly practiced in Europe and Singapore where to date no aviation safety concerns have been raised.

The radio altimeter is a mandated critical aircraft safety system used to determine an aircraft's height above terrain. Its information is essential to enable several safety related flight operations and navigation functions on all commercial aircraft as well as a wide range of other civil aircraft. Such functions and systems include terrain awareness, aircraft collision avoidance, wind shear detection, flight controls and automatic landing capability in an aircraft. Anomalous (missing or erroneous) radio altimeter inputs could cause these other systems to operate in an unexpected way during any phase of flight - most critically during take-off, approach, and landing phases. These anomalous inputs may pose a hazard that could remain undetected during critical phases of flight.

## **Safety Recommendations**

1. Operators are strongly encouraged to use Safety Management Systems (SMS) tools to assess the risk to each type of radio altimeter configuration and how it impacts typical flight operations.
2. Passengers are to be reminded that all portable electronic devices allowed for transport in checked baggage (including smartphones and other devices) should be turned off and protected from accidental activation. Compliance is mandatory for lithium battery-powered portable electronic devices.
3. Passengers are to be reminded to set all portable electronic devices in the cabin, and any carry-on bags to a non-transmitting mode or turned off.
4. Seek information from the manufacturers of the aircraft and the radio altimeter on possible effects of harmful interference due to 5G frequency and possible pilot interventions.
5. Operators should ensure pilots are aware of:
  - a. the potential degradation of the radio altimeter capabilities and any means to compensate for in-flight radio altimeter anomalies when operating into other countries. Consider both erroneous altimeter readings and loss of altimeter function.
  - b. the potential degradation to the capabilities of safety systems and other equipment dependent upon radio altimeters and any means to compensate for resulting anomalies. Consider both the loss of function of the safety systems and other dependent systems and the manners in which they may malfunction.
6. Operators should consider the potential loss of pilot trust in dependent aircraft safety systems in the assessment of existing and the development of new crew procedures.
7. Operators and pilots who experience radio altimeter anomalies must notify air traffic controllers immediately. A detailed report must include information to describe radio altimeter anomalies.
8. Operators flying internationally 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.
9. Any occurrence arises due to interference of 5G Network shall be reported via Mandatory Occurrence Report and submitted via the CAAM official website. (<https://www.caam.gov.my/contact-us/feedback/>)

CAAM will continue to closely monitor development of the issue for any further relevant information and guidance.



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For Civil Aviation Authority of Malaysia

20 January 2022