



AERONAUTICAL CIRCULAR - AC/ALD-GEN/02/2022

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02 February 2022

1. Subject:

REQUIREMENTS TO MITIGATE 5G INTERFERENCE OPERATIONAL RISKS

2. Reference Publications:

Assessment of C-Band Mobile Telecommunications Interference Impact on Low Range Radar Altimeter Operations (RCTA Paper No.274-20/PMC-2073)

3. Applicability:

- Bahrain Aircraft Operators
- Air Traffic Control Units

4. Purpose:

This circular is issued to address major operational risks raised by the International Aviation community that interference from 5G technology has the potential to affect the safety and operation of airborne radio altimeters and Wireless Avionics Intra-Communications (WAIC) Radio. 5G runs on dedicated bands of radio frequency spectrum.

As we currently have one critical Aviation Safety Technology called the Radio Altimeter, which indicates the airplane's height and supports safe landing, operates in the 4.2 – 4.4 GHz spectrum band; cell phones are currently not permitted to operate in that band or any nearby band to prevent interference. However, if the worldwide Telecommunication Authorities reallocates the 3.7-4.2 GHz band for 5G, the risk of interference could increase.

It is important for the Aviation World to assess the 5G Telecommunications Interference Impact on Low-Range Radio Altimeter (LRRA) Operations and assess the potential for interference to radar altimeter operations due to 5G telecommunication signals transmitted on frequencies near to the 4.2-4.4 GHz band.

5. Potential Safety and Operational impact (Anywhere close to terrain):

- Could inhibit some functionalities of the TAWS (Terrain Alerting Warning System) reactive modes which would remove a safety net in case against CFIT (Controlled Flight Into Terrain).



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6. Impact if 5G Base Stations are Located too Close to Airports:

- Could Jeopardize flare maneuver (manual or auto).
- Risk of Go Around as landing laws may be affected.
- Diversion as there is no possibility to land in low visibility conditions.
- Spurious fault messages or Audio in the cockpit.

7. Recommendations:

- (a) Considering the high likelihood of 5G Interferences on aircraft system, Bahrain Aircraft Operators should be aware of the concern described in this Circular, and collect, analyze, and monitor hazard and its consequences posed by 5G interferences.
- (b) Bahrain Aircraft Operators should identify measures to early detect and address the risk of loss of critical aircraft system affected by 5G band through SOP and training. Additionally, where a State, based on safety analysis of its own 5G roll out, has issued a NOTAM or similar directive, Bahrain Aircraft Operators are required to adhere to any State operational restrictions. The absence of a NOTAM does not necessarily imply that interference will not be encountered.
- (c) Flight Crew and those involved in Operational Control/Dispatch should be able to identify the AD status of each aircraft in their fleet and the relevance of any applicable AMOC to ensure correct operational restrictions are applied (if required) for the route of flight. For clarity, this includes flights to airports, through the airspace of, or when using en-route alternates belonging to, a State that has issued 5G related NOTAMs.
- (d) Flight Crew experiencing radio altimeter or auto flight malfunctions should not assume that this has been caused by 5G interference and should follow normal operating procedures for any malfunctions or failures. Although Flight Crew should be aware of the possibility of 5G interference, any malfunctions observed may well be caused by other factors such as radio altimeter and associated antenna technical failures.
- (e) All Bahrain Aircraft Operators may consider adapting their Flight Data Monitoring to identify 5G inference events, if found practical.
- (f) Bahrain Aircraft Operators or their Flight Crews should notify the appropriate Air Navigation Service Provider providing Bahrain Air Traffic Services of any confirmed as due to 5G Interference, as and when appropriate.



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- (g) Operators are responsible for ensuring compliance with ANTR OPS 1.110 regarding the use of Portable Electronic Devices on board an aircraft.
- (h) Any Flight Crew observations of radio altimeter or autoflight malfunction should be reported using normal company safety reporting procedures. Flight Crew should include as much details regarding the type of malfunction, including duration and location (particularly if during an approach or departure phase), the runway in use and the height above the ground that the malfunction was observed. If the commander assesses that the malfunction resulted in a significant risk to aviation safety the report should be submitted as an MOR, in accordance with the BCAA requirements.

Acting Undersecretary for Civil Aviation Affairs

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