EASA
European Union Aviation Safety Agency

5G radio frequency spectrum issues and aviation safety – the European perspective

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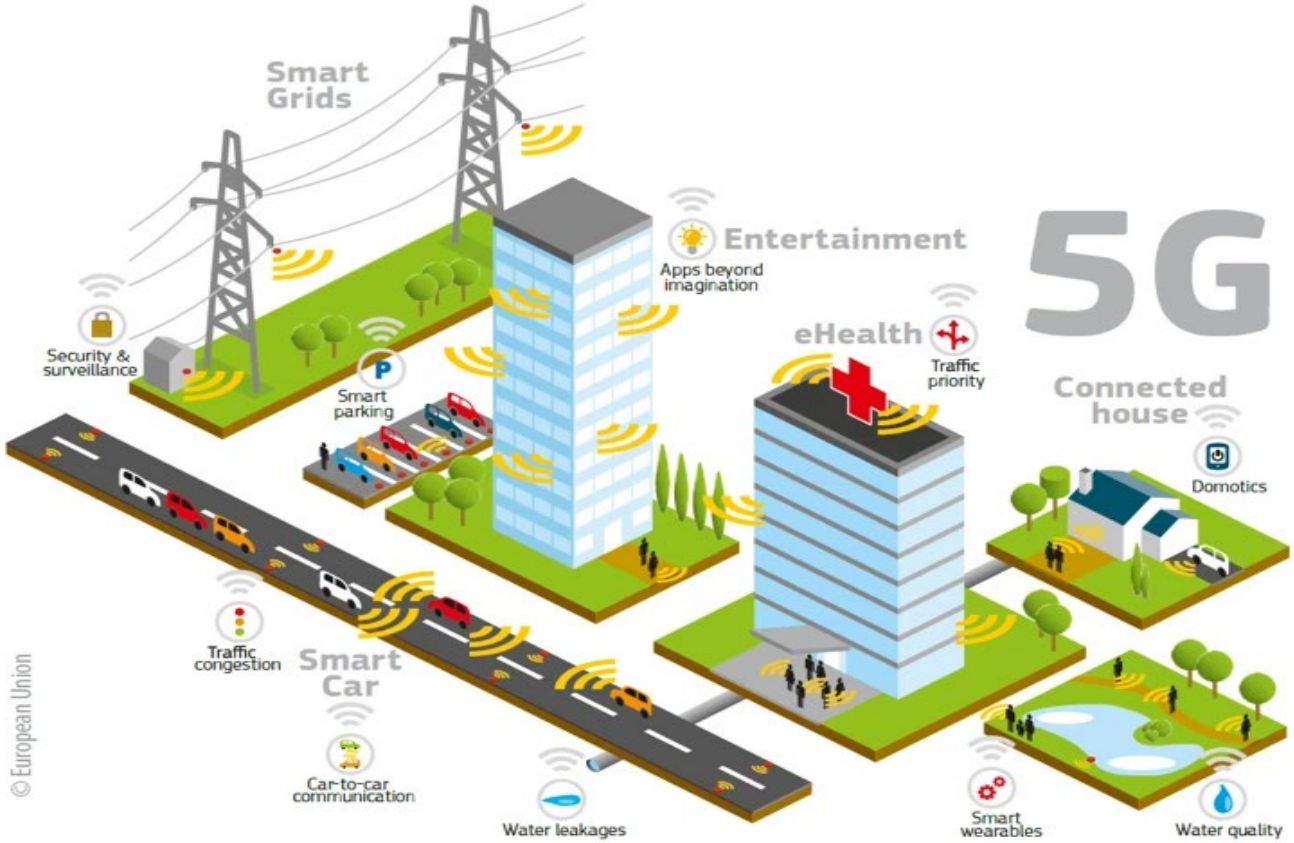
Note:

Throughout this presentation, the phrase ‘radar altimeter’ is used. The terms ‘radar altimeter’, ‘low range radar altimeter’, its abbreviation LRRA and ‘radio altimeter’ may be used interchangeably.

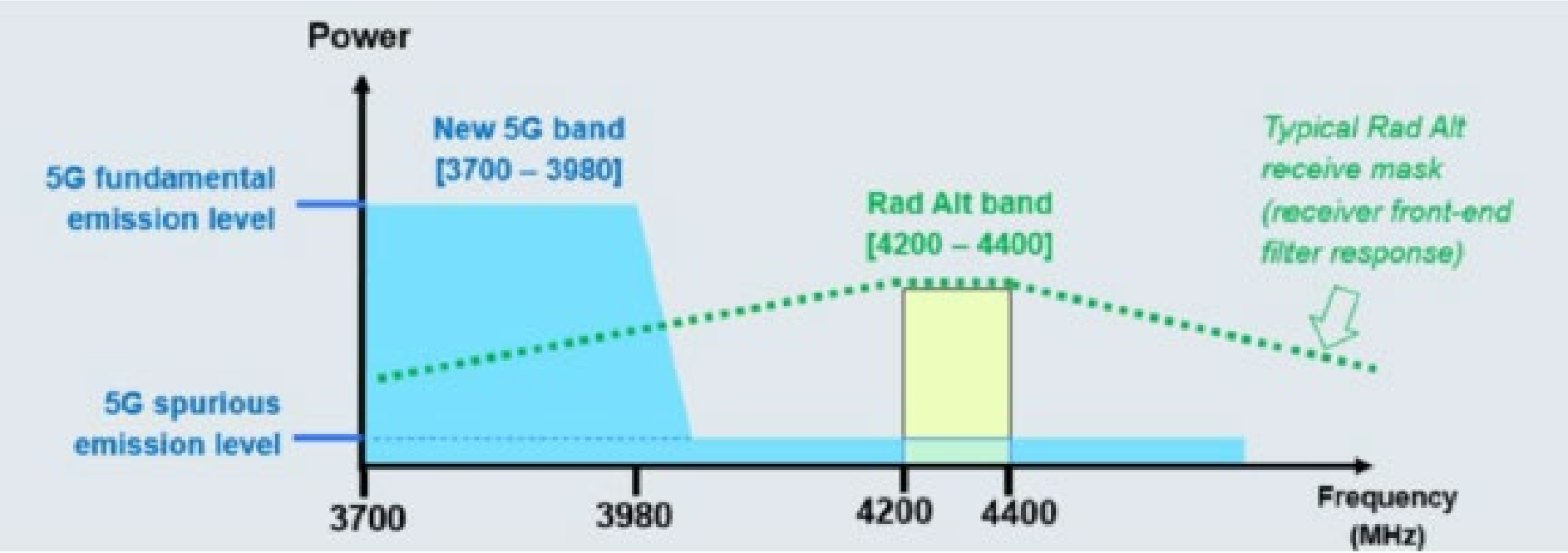
General overview on 5G

In telecommunications, 5G is the fifth-generation technology standard for broadband cellular networks, which cellular phone companies began deploying worldwide in 2019.

[Wikipedia]



5G Potential Interference explained



Is it only a problem in the US?

No, it isn't:

- → The aircraft and on-board equipment are of course common across all airspace
- → Deployment of 5G in, often involves different conditions including:
  - → Different power levels
  - → Different antenna orientation
  - → Different antenna types
  - → Different placement of antennas relative to airfields
  - → Different frequency bands
- → In conclusion: The risk is not just directly proportional to power.

Why does EASA's assessment differ from the FAA's?

- → Firstly, EASA does not challenge FAA's assessment.
- → We arrive at slightly different conclusions because the assessment is dependent on many assumptions:
  - → System level effects vs. aircraft level effects.
  - → Worst case vs. actual deployment scenarios.
  - → Crew intervention vs. no crew intervention.
  - → Include effects on ATM vs. excluding these.
  - → Consider risk per aircraft type vs. risk of the entire fleet.
- → The regulatory context also differs.

Where do our respective assessments differ?

- Overall, our assessments are largely aligned:
  - We agree that interference, is highly undesirable, could occur and could (potentially) impact safety.
- Where our assessments differ is the urgency to take action:
  - FAA: Unsafe condition declared – short term (immediate) action required.
  - EASA: No conclusive evidence of an unsafe condition at this time – medium to long term action.

Some States implemented protection zones around aerodromes, why did EASA not mandate this across the EU?

- → EASA would need a sound justification for such a mandate, such as an established unsafe condition.
- → No conclusive evidence of an unsafe condition exists.
- → The implementation of protection zones has considerable economic and societal impact.
- → EASA's remits are limited and bound by strict regulations (BR and IRs).
- → EASA however, does not challenge decisions taken by the States.

How does aviation coordinate with telecom?

- → In Europe, coordination between aviation and telecom companies, happens through the Conference of European Postal and Telecommunications administrations (CEPT).
- → In support of the CEPT discussions, EASA has been facilitating informal meetings between the EU based telecom and aviation industry.
- → Further coordination takes place with the Commission (both DG MOVE and DG CNECT) and Eurocontrol.

What will happen in the long term?

- → A updated Minimum Operational Performance Standard (MOPS) for radar altimeters is being developed by a joint EUROCAE / RTCA Working Group / Special Committee: WG-119 / SC-239
- → The new standard will contain requirements ensuring robustness against potential interference from mobile telephony.
- → Once the new standard has been published, EASA intends to update CS-ETSO to reflect the new standard.

What will happen in the long term?

- No decision has been taken on the need for a retrofit of the fleet operating in the EU.
- Safety is obviously a concern as 5G and later generations become commonplace.
- But like anyone else using radio frequency spectrum, aviation needs to comply with the ITU Radio Regulations too. ITU Radio Regulations Article 4.1 states:

  Member States shall endeavour to limit the number of frequencies and the spectrum used to the minimum essential to provide in a satisfactory manner the necessary services.

  To that end they shall endeavour to apply the latest technical advances as soon as possible.

Is the 5G concern unique?

No, it isn't:

- → The compatibility issue of 5G and radar altimeters is not the first, and will likely not be the last case of potential interference in frequency bands used by aviation.
- → Examples from the past include: FM Immunity (EU), Ligado/Lightsquare vs. GNSS (US), Program Making and Special Events (PMSE) vs. DME (UK).
- → EASA promotes a more holistic view on spectrum use by aviation and support the activities of EUROCAE WG-124 / RTCA SC-242.
- → This WG / SC should support the work of the ICAO FSMP.

How does EASA support its applicants?

→ Applications for ETSO authorization of updated radar altimeter equipment and applications for airworthiness approval to install an updated radar altimeter on aircraft are prioritised.

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Thank you for your attention!

easa.europa.eu/connect

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