Impact of 5G deployment on Airline Operations

February 21st, 2022.

Outline

- US 5G Implementation Air Carrier Lessons learned
  - presented by Captain John Dudley and Wes Googe, America Airlines
- Key messages
- Moving Forward

US 5G Implementation
Air Carrier Lessons learned

Captain John Dudley
Wes Googe

Lessons Learned

American Airlines

- **Operator Challenges**
  - AMOC management challenges
    - Extensive preparation work for possible cancellations, reroutes, Flight Crew scheduling problems.
      * Required activation of company crisis center for Jan 19th implementation
    - Insufficient level of harmonization between telecom, aviation regulator and aircraft OEMs have lead to last minute issuance of appropriate AMOCs and approved airports for aircraft fleets.
    - Airport selection for required weather alternates has become more complicated
    - Aircraft routing for routine overnight maintenance operations has become heavily influenced by possible uncertainty of access to 5G NOTAM'd airports.

- **Aviation Safety Culture**
  - **Lack of understanding and appreciation by Wireless industry for safety environment that dictates Aviation operations today**
    - Future recognition and agreement is an absolute must to realize accurate and reasonable reallocation of frequency spectrum that is not harmful to Aviation
  - **Lack of agreement between aviation and spectrum regulators on required safety margins that are used in aviation related products and operations**
    - Aviation and Spectrum regulators must agree to create the regulatory criteria that will, as much as possible, respect the future development of the telecom industry while still respecting the safety requirements that govern aviation equipment and operations.

Lessons Learned

- **Future Aviation and Telecom existence**
  - Need for a regulated criteria driven stable RF environment around airports going forward for aviation to have use of radar altimeter technology that can have a reasonable life span.
    - Aviation and Spectrum regulators have to agree on a long term environment
    - Operators do not want to have entertain periodic equipment updates due to a changing RF environment

QUESTIONS

Key Messages

- Spectrum is a scarce resource with competing interest.

- AMOC process is an unsustainable “lifeboat.”
  - VERY complex process
  - Unpredictable changes and difficult to plan

- Safety co-existence between aviation and 5G is possible, but requires
  - Early coordination and active engagements between State aviation and telecom authorities
    - Open dialogue and sharing of technical information and implementation plan
  - Leadership within governments to facilitate the interagency and inter-industry dialogue
  - Different technical culture: Safety vs Speed must be addressed early
  - Appropriate codified conditions/regulations by telecom authorities under agreement between aviation regulators and operators prior 5G auctions/deployments

Moving Forward

- On-going collaboration between aviation and telecommunication stakeholders

- Medium-term: Through State regulation, necessary mitigations are in place:

  - recommended by ICAO and supported State aviation authorities
  - codified by State telecommunication authorities
  - include suitable combination of
    - appropriate 5G power limit and transmitting pattern
    - sufficient frequency separation from 4.2-4.4 GHz used by radio altimeters
    - appropriate protection and pre-cautionary zones around airports and flight path
  - ensure aviation safety and uninterrupted flight operations and services
  - provide stable, known implementation conditions supporting 5G deployment

- Long-term: Known, stable and plannable global spectrum environment, particularly near frequency band allocated to aviation.