



AIR LINE PILOTS ASSOCIATION INTERNATIONAL

THE WORLD'S LARGEST PILOTS UNION • WWW.ALPA.ORG

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May 23, 2016

Federal Communications Commission
445 12th Street, SW
Washington, DC 20554
United States of America

Attention: Marlene H. Dortch, Secretary

Dear Ms. Dortch:

The Air Line Pilot Association, International (ALPA) is largest airline pilot union in the world and represents over 53,000 pilots at 31 US and Canadian airlines. Based on our review of Federal Communication Commission (FCC) Docket No. 11-109 and IB Docket No. 12-340, there are still significant concerns with regard to the potential impact that the proposed system will have on certified aircraft navigation systems. Until there is quantitative data that eliminates any doubt that the system will not require equipment changes or the imposition of new limitations on the operations of airline aircraft, ALPA encourages the FCC to delay the approvals for spectrum use.

Ligado hired Roberson and Associates (RAA), an independent consulting company, to conduct Global Positioning System (GPS) interference testing to support their modification application. The Roberson and Associates "*Results of GPS and Adjacent Band Co-Existence Study*" tested 29 GPS devices which included one non-certified aviation device, but it did not evaluate certified aviation devices as commonly found on airline aircraft.

The Technical Operating Parameters specified in the proponent's application assumes existing certified GPS aviation receivers will not experience interference if Ligado lowers power levels across the GPS spectrum or aircraft are retrofitted with new GPS antennas for compatibility with Ligado's proposed power requirements. The "*Results of GPS and Adjacent Band Co-Existence Study*" document stated:

..."certain other devices - primarily high precision devices using stock antennae - showed greater effects in the proposed lower downlink and lower uplink bands. All affected devices that were able to be re-tested with a filtered antenna became compatible with Ligado's proposed operations in all bands when using the new antenna".

Based on the adjacent band study quoted above, even with Ligado's proposed dBW limits, it appears that there is a strong probability for certified aviation GPS devices to experience interference at the proposed power limits. Any interference will potentially impact automatic landing operations, which require reliable GPS navigation. These operations occur in the critical phases of flight where the aircraft are close to terrain and obstacles which are hazardous to safe aircraft operation.

The study further implies that an antenna retrofit for existing aircraft may allow coexistence with certified receivers across the spectrum. Many airline aircraft are already equipped with GPS based landing systems around the world. Simply stating that a retrofit will be necessary for aircraft that are required to use certified receivers implies a simplistic solution that is not easily achievable. Besides the fact that such a retrofit is not a cost effective solution, changes to all aircraft around the globe will take significant time, after technical solutions are identified and standards are developed.

In addition to the use of GPS for high-precision landing systems, the aviation industry has invested heavily to meet the Federal Aviation Administration (FAA) NextGen requirement for equipment to operate in the National Airspace System (NAS) with another satellite based technology called Automatic Dependent Surveillance-Broadcast (ADS-B). Any changes to GPS interference levels that require an aircraft antenna retrofit has the potential to delay industry efforts to meet the FAA's equipment timeline for ADS-B as well.

The RAA testing did not include certified aviation devices because, as Ligado explained in its applications,

"these devices will operate in deference to power limitation requirements for the 1526 - 1536 MHz band necessary to achieve compatibility with current and future MOPS that are incorporated into an active Technical Standard Order from the FAA. The company's consultation process with FAA and industry stakeholders is ongoing and Ligado's assessment of aviation devices will be undertaken consistent with FAA, RTCA, and industry practice."

Given the fact that the Ligado work with FAA and industry stakeholders is ongoing, ALPA urges the FCC to address all unresolved issues for certified aviation receivers regarding interference to GPS before it allows Ligado to begin the terrestrial broadband network services proposed by the application.

ALPA supports the FCC's goal to manage spectrum, so that wireless broadband services are broadly available, and we remain committed to working with all relevant stakeholders to achieve this goal. However, such objectives must not come at the expense of critical GPS services or costly antenna retrofitting to existing aircraft requiring certified aviation receivers to operate in the NAS.

We appreciate the opportunity to submit comments on this proposal.

Sincerely,



Darrell Pennington
Staff Engineer
Air Line Pilots Association, International