

Free Route Airspace Implementation Efforts in the Latin America and Caribbean Region through Collaboration

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The Federal Aviation Administration (FAA) and the Civil Air Navigation Services Organization (CANSO) established the CANSO Air Traffic Flow Management (ATFM) Data Exchange Network for the Americas (CADENA) Regional Implementation Group (RIG) in 2016. Since its establishment, CADENA has delivered several improvements that have led to the Free Route Airspace (FRA) implementation efforts in the Latin America and Caribbean (LAC) region. This presentation provides CADENA's background and its accomplishments achieved through the successful collaboration of Air Navigation Service Providers (ANSPs), airlines, and other industry stakeholders. Accomplishments include the implementation of the Planned Airway System Alternatives (PASA) reroute database and the end-to-end route request capability. It also notes two types of route optimization trials and their results: PASA route optimization 90-day trials and user preferred route (UPR) trials. The trials started in 2021, and CADENA will continue both types of trials during 2022 and 2023.

1. Introduction

In 2015, FAA Administrator Michael Huerta set forth with several Global Leadership Key Initiatives including a Caribbean ATFM implementation initiative. The FAA and CANSO organized the CADENA RIG to promote and facilitate the safe and efficient movement of air traffic within in the LAC region.

2. PASA Database to 90-Day and UPR Trials

Established in 2016, the CADENA RIG delivered many improvements that have led to FRA implementation efforts in the LAC region. For example, the CADENA RIG created the PASA reroute database that contains pre-coordinated routes to avoid certain airspaces, which was particularly useful when we experienced ATC-Zero events during the COVID-19 Pandemic. The CADENA RIG implemented the PASA end-to-end route request capability through the CADENA Operational Information System (OIS) in 2020. Specifically, airlines can submit the routes they want via OIS requesting the ANSP's approval. The COVID-19 vaccine delivery flights use this capability to deliver vaccines in a safe and timely manner. This capability also supports flights to avoid specific airspace issues, and these improvements pre-date PASA route optimization trials.

The PASA route optimization 90-day trials began in July 2021 with the city pair of Atlanta, USA and Lima, Peru. There are six ANSPs involved in this route. It is CADENA's policy to respect the ATFM maturity levels of each ANSP and CADENA asks each ANSP to "do your best" to accommodate the route requested. Thus, the trial route may not be the fully optimized route. However, this is the best route the airline can fly considering constraints. CADENA completed six such 90-day trials with various city pairs by March 2022. Airlines reported the savings of each trial flight for 90 days, and these observed savings numbers were translated into savings over the course of one year. As for

the six trials, we estimated the total 1-year savings of 13K flight minutes, 2.6M pounds of jet fuel, 3.7M Kg of CO₂, and over 1M operational cost in US dollars.

There are several lessons we learned from the PASA 90-day trials. Collaboration among all involved is highly important. We have created the CANSO, IATA, and ICAO FRA (CIIFRA) Team to work together. It was clear that airlines prefer direct routing (DCT) and many DCTs are not published. DCT is one of the ICAO Aviation System Block Upgrade (ASBU) Elements, and DCT is the predecessor to the FRA. In addition to unpublished DCTs, the trials identified desired routes that were unpublished. The CIIFRA Team initiated the work to establish the process and support system to publish new DCTs and routes.

The CIIFRA Team started the UPR trials in February 2022 using the Atlanta-Lima city pair. This step-by-step process ensures that safety is intact during the trials. As of April 2022, the CIIFRA Team conducted three trials: Step 0 trial was to fly one of each flight leg coordinated through CADENA OIS; Step 1 trial was one round trip with prior coordination; and Step 2 trial was three consecutive round trips. UPR trial results were compared to the baseline route, and the PASA optimized route. The UPR trials produced excellent results saving significant flight time, fuel, CO₂, and operational costs.

3. Conclusion

This presentation shares the successful approach to move towards regional FRA implementation through collaboration. In addition to more PASA 90-day trials with new city pairs, the next step is to conduct UPR 90-day trials followed by the implementation of free routes between the city pair and/or the FRA of a certain area.