



**Twenty Second Meeting of the
Informal South Pacific ATS Co-ordinating Group (ISPACG/22)**

Papeete, Tahiti, 12-14 March 2008

Agenda Item 5: Identify Future Work Programmes

Implementation of Shared Performance Metrics

Presented by the Federal Aviation Administration

SUMMARY

As a result of activities kicked off by the 2006 International Oceanic Airspace Conference, the FAA has begun implementation of data sharing and collaboration with partner ATS service providers in order to support shared performance in the oceanic environment.

1 Introduction

- 1.1 At ISPACG/21, the FAA presented the outcomes of the 2006 International Oceanic Airspace Conference (IOAC) Performance Measurement Workshop. The stated goal of that workshop was to “create a shared understanding of stakeholder perspectives, and to promote a unified international approach for tracking and measuring collective success in oceanic airspace through performance metrics.”
- 1.2 In support of these goals, in 2007, the FAA began development of shared performance metrics with the Japan Civil Aviation Bureau (JCAB). The FAA is interested in pursuing similar shared metrics with ISPACG service providers to support and promote the implementation of service improvements and efficiencies in the region.

2 Discussion

- 2.1 The creation of a meaningful and consistent shared performance metric involves the routine exchange of operational post-data between ANSP partners. This data includes flight plan, clearance and surveillance information such as high frequency (HF), Controller Pilot Data Link Communication (CPDLC) and Automatic Dependent Surveillance (ADS) messages. Establishing this routine data exchange represents a significant challenge due to the differences in approach among service providers in the storage and retrieval of such data. Additionally, the data formats employed by each ANSP are typically dissimilar, requiring careful examination to ensure that data points are correctly synched between service providers.
- 2.2 In 2007, the FAA and JCAB established a plan to develop a test metric using samples of JCAB data in conjunction with FAA data for the same aircraft on the same dates. The airspace selected was a subset of NOPAC and Pacific Ocean Track System (PACOTS) flights between Japan and the US West Coast. From these data samples, the FAA created a data

parsing capability to allow the rapid integration of JCAB data into the FAA’s Oceanic performance analysis tools. Once integrated, the FAA used the combined trans-Pacific data to create a sample performance metric.

2.3 For the purpose of the FAA/JCAB test, three test metrics were targeted:

- Comparison of fuel burn calculated from the filed trajectory v/s the actual flown trajectory
- Percentage of altitude change requests as granted by ATC
- Average comparison of filed altitude v/s actual flown altitude

2.4 The targeted performance metrics as well as other metrics under consideration are described in the table below:

Metrics	Development Process	Reporting Mechanism
Measurement Development: Delta fuel IOAC Delta time IOAC Delta distance	A procedure has been established to process daily trajectories with the initial daily winds files through Optimal Trajectory Generator (OPGEN) fuel and summarize the information into one file that contains a record for each flight on fuel, time and distance. A program should be developed that compares the record of flown with cleared, calculates the deltas and summarizes for reporting purposes by month and city pair.	Delta fuel: percentage difference of estimated filed fuel burn Delta time: percentage difference of estimated filed time Delta distance: percentage difference of estimated filed distance
Measurement Development: Altitude requests granted	A query should be developed that selects only those records from the Oracle change staging table that match the aircraft IDs from the scenarios.	Percentage of requests granted within a set limit of time
Measurement Development: Route requests granted	Some of the route requests may be stored in the change staging table (e.g. - if an altitude was requested). Other route requests will need to be evaluated to determine how to capture and measure the response.	Percentage of requests granted within a set limit of time

Metrics	Development Process	Reporting Mechanism
Measurement Development: Altitudes (percentage of time on sub-optimal altitude + delta altitude (des-act))	A program should be developed to calculate time from the altitude and determine the average delta from the altitude. Also, the optimal altitude will need to be defined (e.g. - filed altitude, requested or modeled).	Percentage of time on sub-optimal altitude Delta altitude: ratio of average flown altitude to average filed altitude
Measurement Development: Navigation fees	A program should be developed to take cleared flight airspace pierces and calculate the navigation fees, then repeat the process for flown flight.	TBD

2.5 At the Twenty Seventh Meeting of the Informal Pacific ATC Coordinating Group (IPACG/27), the FAA and JCAB presented preliminary results of the test shared performance metric. These results indicated that under many conditions, the calculated fuel burn for trajectories actually flown was less than the calculated fuel burn for filed flight plan trajectories. The discussion surrounding the test metric results indicated that there was no consensus among aircraft operators and ANSPs as to how best use a filed versus flown metric as an indicator of oceanic performance. It was agreed at the meeting to continue work to develop a shared actual-flown fuel burn metric for assessment of fuel burn changes over time. The FAA will also work to produce a parallel metric for assessment of greenhouse gas emissions.

2.6 In January 2008, further analysis of the data samples provided to the FAA by JCAB indicated previously undetected discrepancies between flight altitudes and times where FAA and JCAB data was merged. JCAB and FAA analysts believe that these discrepancies are a likely result of time/date stamp differences between data formats, however further analysis is ongoing.

3 Conclusion

3.1 The lack of consensus over the utility of a Filed vs. Flown fuel burn metric for performance assessment and decision making indicates that further discussion among ANSPs and aircraft operators is necessary.

3.2 Difficulties encountered in comparison of operational data between the FAA and JCAB underscores the importance of establishing data sharing and analysis arrangements among ANSPs sooner, rather than later in order to expedite the development of shared performance metrics.

3.3 Agreements among ANSPs, such as the Asia and South Pacific Initiative to Reduce Emissions (ASPIRE) emphasize the importance of data sharing and the development of common performance indicators in fuel and emissions calculations.

4 Actions by the meeting

The meeting is invited to:

4.1 Support the establishment of regional performance measurements in order to quantify gains in efficiency and reductions in harmful greenhouse gasses.

- 4.2 Encourage ISPACG ANSPs to conduct data-sharing test exercises in order to facilitate the establishment of routine South Pacific shared performance metrics.
- 4.3 Continue dialog between service providers and aircraft operators to identify the optimal metrics that will aid in the measurement of airspace performance and the identification of areas for efficiency and environmental gains.