

**Twenty Fourth Meeting of the
Informal South Pacific ATS Co-ordinating Group (ISPACG/24)**

**FANS Interoperability Team Meeting (FIT/17)
Brisbane, Australia, 9-10 March 2010**

Agenda Item 7: ANSP monitoring

**OBSERVED ERRORS IN THE ESTIMATED TIME AT NEXT POSITION IN ADS-C
REPORTS RECEIVED AT THE NEW YORK AND OAKLAND CENTERS**

Presented by the Federal Aviation Administration

SUMMARY

This paper provides a summary of observed errors in the estimated time at next position contained in ADS-C position reports received at Oakland and New York oceanic centers.

1. INTRODUCTION

- 1.1 This paper provides summary information on observed errors in the estimated time at next position contained in ADS-C basic periodic and waypoint change reports. These errors were contained in reports received at both Oakland (ZOA) and New York (ZNY) oceanic centers.
- 1.2 The data source for this paper is the data reduction and archives from the FAA's oceanic automation system, Ocean21. The sample period of 1 August 2009 through 31 January 2010 was examined for this paper.

2. DISCUSSION

2.1 Methodology

- 2.1.1 Aircraft utilizing ADS-C for position reporting transmit two message types which contain estimates of next position; the Waypoint Change Report (WPC) and Basic Periodic Report (BAS). The reported positions for all aircraft utilizing ADS-C were assembled and organized by message time. The ADS-C messages containing estimates of next position were examined and messages with the current position time exactly equal to the estimate of time over next position were extracted from the data for further analysis.
- 2.1.2 Table 1 contains a summary of the initial set of data extracted from the ZOA and ZNY data sets.

Table 1. Number of ADS-C Reports with Current Position Time Equal to the Estimate of Time Over Next Position

Month	ZOA	ZNY
August 2009	63	24
September 2009	52	91
October 2009	53	103
November 2009	48	89
December 2009	44	84
January 2010	44	89
Totals	304	480

2.1.3 To further examine the data, the distance between the current position and the estimated next position in each message was calculated as a great circle distance. The assumed average speed of aircraft is typically taken to be 8nm/min. Taking into account the available precision in the time data provided each report and the assumed average aircraft speed, reports containing the error with the estimated distance to the next position of 8 nm or less were removed from the analysis. Table 2 contains the total number of reports remaining this step.

Table 2. Number of ADS-C Reports with Current Position Time Equal to the Estimate of Time Over Next Position After Removing Reports with Current Position < 8nm from Next Position

Month	ZOA	ZNY
August 2009	4	10
September 2009	3	81
October 2009	4	98
November 2009	0	78
December 2009	1	77
January 2010	1	77
Totals	13	421

2.1.4 Table 2 shows a significant drop in the number of errors from Table 1 for ZOA but the same reduction was not observed for ZNY.

2.1.5 To further study the remaining errors, the aircraft type, aircraft current location, and the current message time were examined.

2.1.6 All 13 remaining errors observed at ZOA involved B744 aircraft. All 421 remaining errors observed at ZNY involved Airbus aircraft. The A332, A333, A343, and A346 accounted for 21.14, 9.74, 39.43, and 29.69 percent, respectively, of the remaining errors.

2.1.7 The current locations of the aircraft obtained from each of these remaining errors are shown in Figures 1 and 2.

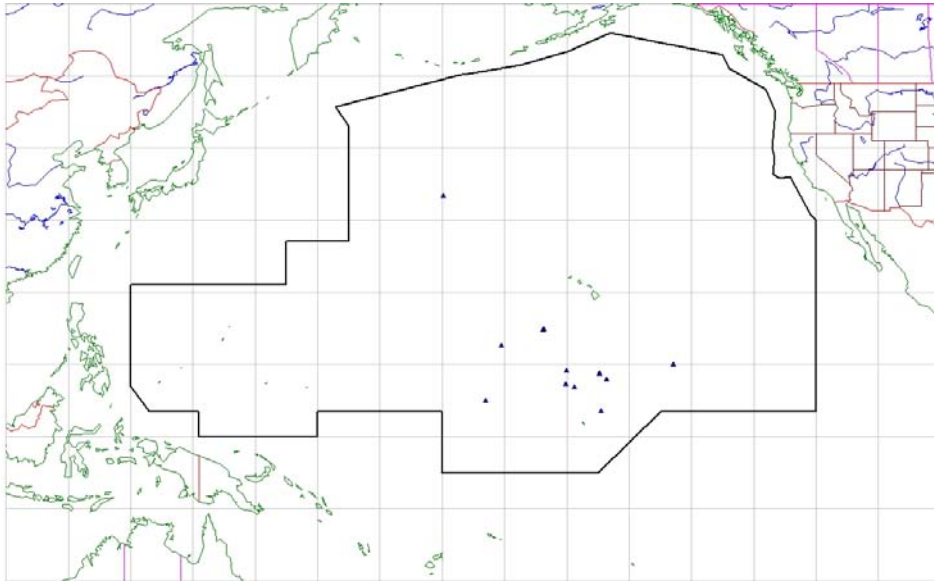


Figure 1. Location of ADS-C Position Reports with Same Current and Next Position Time in ZOA

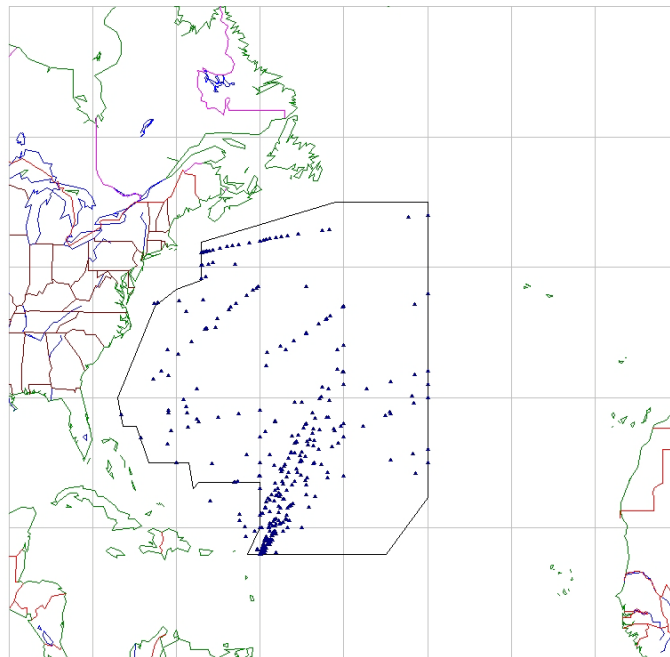


Figure 2. Location of ADS-C Position Reports with Same Current and Next Position Time in ZNY

2.1.8 Lastly, the current position was examined for each of the remaining reports in Table 2. Figures 3 and 4 present the observed current position time.

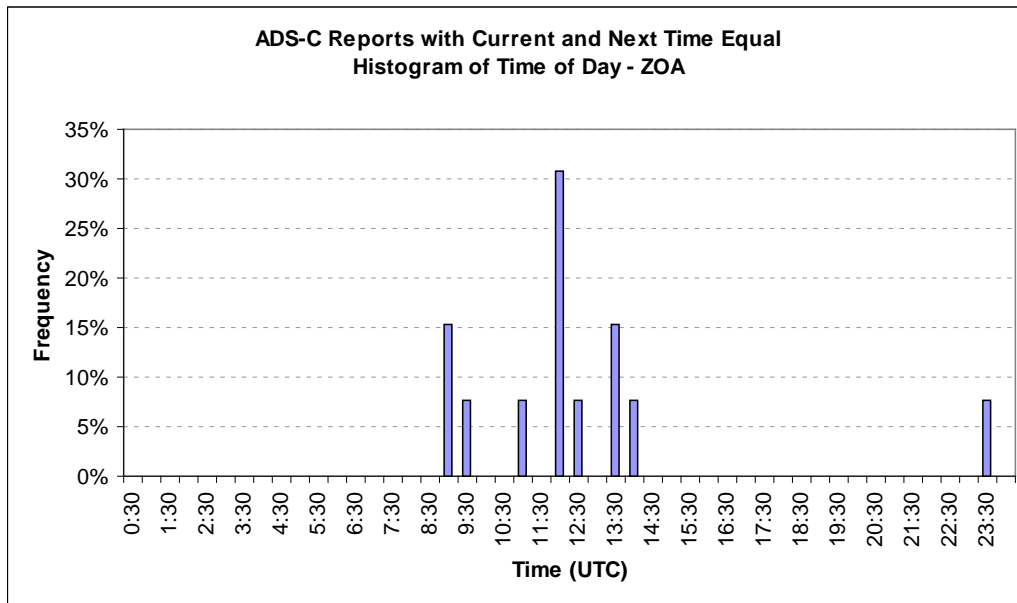


Figure 3. Current Time ADS-C Position Reports with Same Current and Next Position Time in ZOA

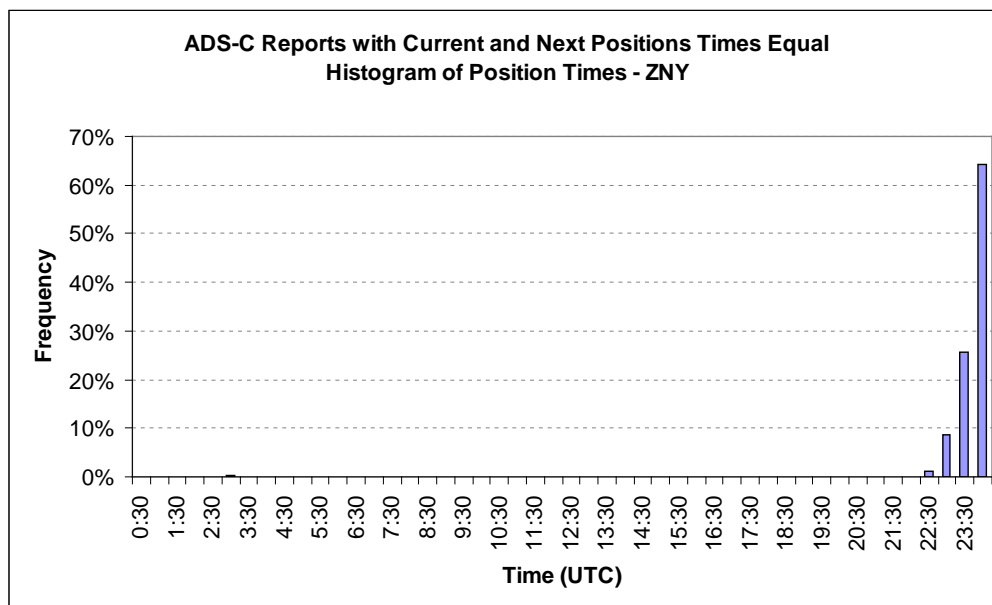


Figure 4. Current Time ADS-C Position Reports with Same Current and Next Position Time in ZNY

- 2.2 The ADS-C reports received at ZNY with the current position time and estimated time over next position equal were all provided by Airbus aircraft. The data do not show any trends related to the current position of the aircraft. However, the data show a pattern associated with the time of the current position shown in Figure 4.
- 2.3 The FAA has notified Airbus of the problem with ADS-C position reporting. Airbus has responded and indicated that the problem has been identified and plans a fix for 2012.



3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Note the information contained within this paper.