Twenty Sixth Meeting of the
Informal South Pacific ATS Co-ordinating Group (ISPACG/26)

Nadi, Fiji, 1-2 March 2012

Agenda Item 4: AI 21-2 ADS-C Climb Descent Procedure

STATUS UPDATE FOR DEVELOPMENT AND IMPLEMENTATION OF ADS-C CLIMB DESCENT PROCEDURE

Presented by the Federal Aviation Administration

SUMMARY

This information paper provides an update on development and implementation of operational trials for the use of the ADS-C Climb Descent procedure.

1. INTRODUCTION

1.1. The Federal Aviation Administration (FAA) is analyzing a new oceanic air traffic control (ATC) procedure, termed Automatic Dependent Surveillance – Contract (ADS-C) Climb Descend Procedure (CDP) in the operational environment. ADS-C CDP utilizes existing user equipage and ATC capabilities to allow more oceanic flights to achieve their preferred vertical profiles. The procedure would address present day performance gaps in the area of capacity, productivity, and efficiency in the oceanic environment. Integral to ADS-C CDP is the use of advanced communication, navigation, and surveillance (CNS) capabilities; i.e., ADS-C, Controller-Pilot Data Link Communications (CPDLC), and Required Navigation Performance (RNP).

2. DISCUSSION

2.1. The ADS-C CDP is modeled after existing in-trail distance measuring equipment (DME) rules set forth in ICAO Doc 4444, paragraph 5.4.2.3.2. Aircraft pair distance verification is performed by Ocean21, using near simultaneous ADS-C demand contract reports. As with the existing DME procedure, responsibility for separation assurance remains with ATC.

2.2. Currently, ADS-C CDP is being demonstrated operationally by manually applying ADS-C CDP requirements without requiring software changes to Ocean21 and is limited to use between RNP-4 certified aircraft. Based on a benefits analysis conducted in 2007, it was anticipated that the ADS-C CDP could be applied once or twice per day in an operational trial. To date, that has not been the case, although it is

hoped that with the introduction of more RNP-4 certified aircraft in the Pacific Region, the number of opportunities to use the procedure will increase.

2.3. With the limiting factor being the required use between pairs of RNP-4 qualified aircraft, it has been difficult to meet the criteria necessary for applying ADS-C CDP. Currently, only 25.5 percent of the aircraft in the Oakland Oceanic Control Area (OCA) flight plan with RNP-4 equipage and only 50 percent of the aircraft use ADS-C. Traffic scenarios do present themselves to the controller where it would be useful to apply the ADS-C CDP procedure, but equipage is lacking on one or both of the aircraft.

2.4. In this phase of the trial, controllers must apply a relatively lengthy checklist to apply the ADS-C CDP. Controller workload limits when the procedure may be applied since the times when traffic levels are high and controller spare time is limited are the times when the greatest opportunity for the use of the procedure exists.

2.5. Fifteen days of aircraft requests for climbs were analyzed in January 2012. During those fifteen days, 81 aircraft were advised unable climb that had a spacing of 16 to 35 nautical miles. While all of these aircraft pairs may not have met all the requirements for the ADS-C CDP, the data indicates that there is potential to apply the procedure more frequently, if the limiting factors outlined above can be overcome.

2.6. More aircraft data needs to be collected to validate the application of the procedure. The current trial is planned to be extended for a second year to gather more data. Another possibility would be to use flight test bench simulators to create scenarios for application of the ADS-C CDP and gather analysis data in that way. Discussions of this option are ongoing.

2.7. If the operational trial can validate that benefits can be realized from use of this procedure, the controller checks that are done manually for the trial will be implemented as an enhancement to Ocean21 software, as an automated procedure.

2.8. The Separation and Airspace Safety Panel (SASP) is working this procedure. The Math Sub Group has been tasked with the mathematical analysis

2.9. The Longitudinal Project Team of SASP has drafted wording for DOC 4444 but is awaiting the mathematical analysis to finalize some of the numbers. The Project Team is also developing an Advisory Circular for implementation.

2.10. Attachment A contains the draft wording for DOC4444.

3. ACTION BY THE MEETING

3.1. The meeting is invited to note the information in this paper.

ATTACHMENT A

Draft Proposed Amendment Wording for Doc 4444

5.4.2.8 *LONGITUDINAL SEPARATION MINIMA BASED ON DISTANCE USING ADS-C*
HOLD FOR NOTE: Refer to Circular XXX

5.4.2.8.1 For aircraft climbing or descending on the same track, the following separation minimum may be used while vertical separation does not exist;

1) 15 nautical miles with same speed or faster aircraft in front.
2) 25 nautical miles when the trailing aircraft is not more than 10 knots or 0.02 Mach faster.

Provided the following conditions are satisfied:

a) near-simultaneous ADS-C demand contracts are issued to manuevering and blocking aircraft to verify the aircraft postion; and
b) vertical separation is reestablished within 15 minutes from the first demand contract request; and
c) the altitude difference between the manuevering and blocking aircraft is 3000 feet or less; and
d) the accuracy of the ADS-C postion reports is less than n?? ; and (NOTE TO members of SASP; determine the accuracy number)
e) Direct controller-pilot communications is maintained; and
f) Ground automation is capable of calculating the distance between aircraft from ADS-C demand reports.