

**Twentieth Meeting of the Cross Polar Trans East Air Traffic Management Providers' Work Group (CPWG/20)**

(Anchorage, Alaska 26-29 October 2015)

**Agenda Item 5: Provide Status on CPWG/19 Actions**

**Implementation Automatic Dependent Surveillance- Contract (ADS-C) Climb/Descent Procedure (CDP)**

**(Action Item # CP14-12)**

(Presented by the Federal Aviation Administration)

**SUMMARY**

This paper presents information on development of automation and procedures to support use of the ADS-C CDP in the FAA's Oceanic Flight Information Regions (FIRs).

**1 Introduction**

1.1. The Automatic Dependent Surveillance – Contract (ADS-C) Climb/Descend Procedure (CDP) is designed to improve service to properly equipped aircraft by allowing an oceanic air traffic controller to have an option for granting an altitude change request when other standard separations, such as ADS-C distance-based 30 NM longitudinal separation minima, do not allow for a climb or descent through the altitude of a blocking aircraft. It is an air traffic control tool to be applied between maneuvering and blocking aircraft pairs.

1.2. The United States (U.S.) Federal Aviation Administration (FAA) developed the ADS-C CDP to utilize existing user equipment and air traffic control (ATC) capabilities to allow more oceanic flights to achieve their preferred vertical profiles. The ADS-C CDP is a component of the Oceanic Trajectory Based Operations (OTBO) program, a critical Next Generation Air Transportation System (NextGen) capability that addresses current 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; e.g., ADS-C, Controller-Pilot Data Link Communications (CPDLC), and Required Navigation Performance (RNP).

1.3. This procedure is based on in-trail Distance Measuring Equipment (DME) rules in ICAO Doc 4444, paragraph 5.4.2.3.2. Aircraft pair distance verification is performed by the Advanced Technologies & Oceanic Procedures (ATOP) automation system, using near simultaneous ADS-C demand contract reports. As with the existing DME procedure, responsibility for separation assurance remains with ATC.

1.4. ADS-C CDP enables oceanic airspace users to benefit from the surveillance provided by ADS-C, and thus to more efficiently use airspace. Specifically, ADS-C surveillance enables climb-through and descend-through maneuvers with less than standard separation (up to 15 NM). As such, controllers can clear qualified aircraft to climb or descend through the altitude of what would otherwise be a blocking aircraft. This ability to maneuver around blocking aircraft will allow aircraft to optimize flight levels over long distance flights, thus reducing fuel burn and emissions. This CDP supports the FAA's goals for fuel efficiency, emission reductions, and increasing air traffic capacity with existing equipment.

1.5. A successful two year manual trial of ADS-C CDP was conducted within the Oakland Oceanic CTA between February 2011 and February 2013. Due to the inherent limitations of the manual trial, the trial was not extended. The FAA began efforts to automate the procedure in ATOP and work began at the ICAO Separation and Airspace Safety Panel (SASP) to incorporate the ADS-C CDP as a global standard in the Procedures for Air Navigation Services- Air Traffic Management (PANS-ATM) Doc. 4444.

1.6. This paper provides updates on automation development and planned ADS-C CDP implementation in the FAA's Oceanic Flight Information Regions (FIRs).

## **2 Discussion**

### *ICAO and FAA Procedures Development*

2.1. Following work conducted at SASP, a Proposal for Amendment (PfA) to PANS-ATM Doc. 4444 was developed and circulated to ICAO States for comment beginning in June 2015 via State Letter AN 13/2.5-15/45 (**Attachment A** refers). It is expected that the ADS-C CDP will be published as a global standard in November 2016.

2.2. The FAA is completing its procedure development for FAA Order JO 7110.65 Air Traffic Control and the United States Aeronautical Information Publication (AIP), with expected publication in May 2016. Additionally, collision risk modeling and other required Safety Management System (SMS) work for all three oceanic FIRs is near completion.

### *Development of ATOP Automation*

2.3. As noted in the introduction to this paper, the ADS-C CDP was trialed with a two page manual checklist. Following the operational trial at Oakland, the FAA began efforts to automate the ADS-C CDP checklist into its Advanced Technology and Oceanic Procedures (ATOP) Platform. The operational and functional requirements of the automation are as follows:

- a) The ADS-C CDP system shall determine when reduced separation standards can be applied for climbing/descending aircraft by determining the eligibility of the request for CDP;
- b) If the initial ATOP conflict probe indicates a conflict situation, the ADS-C CDP system shall account for the aircraft making the request (the maneuvering aircraft), the blocking aircraft, and all other traffic in determining the initial eligibility of the maneuver;
- c) Following this determination, the system shall build and display the appropriate response for the controller (CLIMB TO [flight level] BY [time] or DESCEND TO [flight level] BY [time] message with ADS-C CDP or UNABLE);
- d) The controller shall either issue the clearance for the climb/descend or UNABLE. Thus, from the controller's standpoint, there will be minimal change in operations; and,
- e) The ADS-C CDP system shall be able to handle multiple maneuvers in one or multiple sectors.
- f) If ALL criteria are met, the PRB button in the clearance window, or the Probe button in the altitude popup window, will display CDP with a sky blue background.

2.4. The ATOP automation is expected to be delivered in the January-February timeframe of 2016 to all three FAA Oceanic FIRs. Further testing and controller training will need to be conducted at each facility prior to implementation.

2.5. Additionally, full implementation of ADS-C CDP is dependent upon receipt of an ICAO State Letter that approves ADS-C CDP as a global standard or upon publication of the procedure in PANS-ATM Doc. 4444 in November 2016. The FAA anticipates that it should have receipt of a State Letter prior to November 2016 and will be able to fully implement the procedure mid-CY2016. The FAA may also consider utilizing ADS-C CDP as an operational trial should facilities be ready to use prior to PANS-ATM Doc. 4444 publication.

### **3 Recommendation**

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