FANS Interoperability Team Meeting (FIT/18)

Honolulu, Hawaii, USA, 22-23 March 2011

Agenda Item 4: Working papers

Proposed DARP trial between Australia and United States

Presented by Airservices Australia

SUMMARY

This working paper proposes the introduction of a limited DARPS trial for flights operating between Australia and the United States.

1. INTRODUCTION

1.1 Dynamic Airborne Reroute Procedures (DARPs) permit an aircraft to re-route in flight, typically to take advantage of updated wind information. These re-routes have the potential to improve the efficiency of a flight, resulting in reduced fuel burn and CO_2 emissions.

1.2 DARPs have long been on the ISPACG list of agenda items, but are currently only available for flights between the NZZO and KZAK FIRs. This working paper proposes a more widespread DARPs trial for flights operating between Australia and the United States.

2. DISCUSSION

2.1 TAAATS has software restrictions associated with uplinking CPDLC route clearances. These restrictions occasionally prevent a route clearance from being uplinked to an aircraft. There are controller procedures to workaround this problem but it is not always feasible to implement these procedures.

2.2 Software problems notwithstanding, it is our consideration that a limited DARPs trial can be supported. To this end, Airservices Australia proposes a DARPs trial for aircraft operating between YSSY/YBBN and KLAX/KSFO.

2.3 The general procedures for the DARP trial are in accordance with the GOLD:

The flight crew should downlink the route request:

a) At least 60 minutes prior to the next FIR boundary to permit AIDC messaging to take place between the affected ATSUs. This time period may be reduced between ATSUs that support AIDC CDN messaging to coordinate the modification of route information; and

b) At least 20 minutes prior to the divergence waypoint to allow processing time by the ATSU and the flight crew.

2.4 While it is not explicitly stated in GOLD, a CPDLC re-route would not be available during periods of AFTN outage, due to the loss of AIDC capability.

2.5 For flights departing Australia additional restrictions need to be defined. CPDLC re-route requests should not be made:

- Inside 180NM SY (for flights departing Sydney);
- Inside 140NM BN (for flights departing BN).

2.6 This is to prevent the re-route request being received by controllers not trained in the issuing of CPDLC route clearances.

2.6 It should be noted that the geometry of the YBBB oceanic airspace east of Australia is such that a DARP re-route would rarely be available for a flight tracking due east from SY or BN, due to the flight time to the FIR boundary. However there is a window of opportunity for a DARP for a flight tracking to the north east (i.e. due to the increased flight time prior to the FIR boundary).

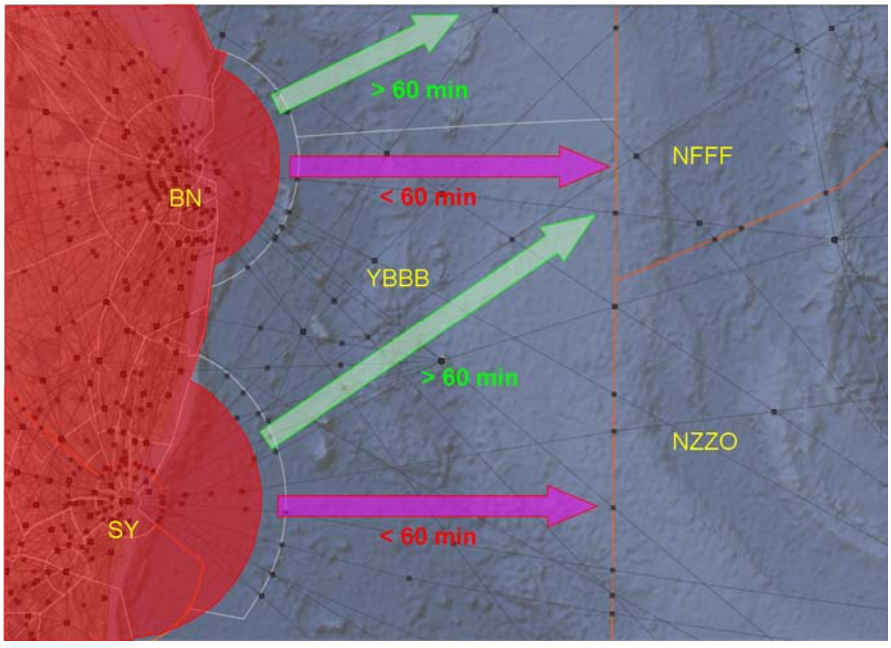

Figure 1. DARPs may not be available for flights tracking due East

2.7 Interoperability issues

2.7.1 There are a number of interoperability issues associated with CPDLC route clearances that need to be highlighted. These issues are not commonly known, and may affect the capability of an ATS Unit in processing a CPDLC route request.

CPDLC functionality	ATS flight plan functionality
Supports <airway> <airway> format e.g. ABARB B450 A346 SALAG	Does not support <airway> <airway> format. Requires a position at the start/end of each ATS route identifier e.g. ABARB B450 TEKEP A346 SALAG
Supports lat/long formats such as: • dd[NS]ddd[EW] • ddmm[NS]dddmm[EW] • ddmm[NS]ddd[EW] • dd[NS]dddmm[EW] Decimal minutes in lat/longs are also supported; e.g. ddmm.m[NS]dddmm.m[EW]	Does not support all the valid CPDLC lat/long formats – only the following are supported: • dd[NS]ddd[EW] • ddmm[NS]dddmm[EW] Decimal minutes in lat/longs are not supported

2.7.2 These interoperability issues do not necessarily prevent an ATS Unit from processing the CPDLC downlink – this depends on the capability of the ATS Unit.

2.7.3 The following are examples of valid CPDLC route clearance requests that an ATS unit may not be able to process due to these interoperability issues.

> REQUEST [YBBN] [KLAX[[24S162E 2341S163E 22S168E 18S176E 14S177W 1155S1742W 9S170W 5S16438W 3S162W 2S161W 2N156W 8N150W 10N148W 17N141W 22N136W 26N131W 31N124W FOOTS ELKEY LAX KLAX]
>
> REQUEST [NZAA] [ZBAA] [ISPID B333 B586 PIKOK KEONE R204 KYWEE TUNTO SAKON OK A586 A593 VYK2]

2.7.4 TAAATS does support decimal minutes in latlongs within CPDLC route clearances. However when the ATS flight plan is updated, the decimal minutes are rounded to the nearest whole minute, which is the format that is relayed in AIDC messages.

2.7.5 However, if any of the other non supported formats described above are received by TAAATS, it will prevent the corresponding response from being uplinked. Workload permitting, the Brisbane controller will attempt to correct any formatting discrepancies but this may not always be possible (e.g. the intersection between two airways may not be known by the controller, or there may not be a defined waypoint at the intersection)

2.7.6 If the changes required are too numerous, the YBBB controller will respond with UNABLE

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) Consider the feasibility of the proposed DARPs trial, discussing any software issues that may affect other ATS Units;

b) If appropriate, develop an implementation plan.