

FANS Interoperability Team Meeting (FIT/19)

Nadi, Fiji, 28-29 February 2012

Agenda Item 4 – Working Papers

Use of CPDLC Freetext with ADS-B In Trail Procedure

Presented by Airways New Zealand

SUMMARY

The current ADS-B ITP procedure uses free text elements (e.g. DM67 and UM169) in conjunction with defined message elements (e.g. DM9, DM10, UM20, UM23). While ICAO Annex 10 Volume II and PANS/ATM Doc 4444 allow the use of free-text both documents specify that the use of free-text other than by using pre-formatted text messages should be avoided. This paper reviews current free text by both flight crew and controllers and invites discussion on the current ICAO provisions. The use of free-text in the ADS-B ITP procedure is under review by OPLINKP and feedback by ISPACCG would assist those deliberations.

1. INTRODUCTION

- 1.1. The current ADS-B ITP procedure uses free text elements (e.g. DM67 and UM169) in conjunction with defined message elements (e.g. DM9, DM10, UM20, UM23). While ICAO Annex 10 Volume II and PANS/ATM Doc 4444 allow the use of free-text both documents specify that the use of free-text other than by using pre-formatted text messages should be avoided.
- 1.2. This paper reviews current free text by both flight crew and controllers and invites discussion on the current ICAO provisions. The use of free-text in the ADS-B ITP procedure is under review by OPLINKP and feedback by ISPACCG would assist in those deliberations.

2. DISCUSSION

Current Freetext use in NZZO and ICAO provisions

- 2.1 If current free text usage is a valid indicator then free text forms an important part of CPDLC in NZZO. In 2011 14% of downlinks from the aircraft and 19% of controller uplinks contained at least one free-text element. The NZZO OCS has some “pre-formatted” elements available for use, some elements are constructed using “cut and paste” e.g SIGMET, and some free-text elements are automatically presented pre-filled to the controller e.g CANCEL BLOCK CLEARANCE. We do not have an

accurate breakdown of the construction method used for all free text messages but controller feedback indicates that most free text messages are constructed by typing the required elements.

- 2.2 Discussions at OPLINK on the ITP procedure and the use of free text were carried out in light of current ICAO provisions. These discussions were centred on the specific provision that free text should be avoided except where pre-formatted. The discussions included the suggestion that free text be restricted in the ADS-B ITP such that only one other aircraft could be involved. This restriction if implemented would significantly limit the use of the ITP and is not seen as necessary by Airways New Zealand.
- 2.3 Current ICAO provisions regarding free text use are as follows:
- **Annex 10 Volume II - 8.2.9.1** “Controllers and pilots shall construct CPDLC messages using the defined message set, a free text message or a combination of both”;
 - **Annex 10 Volume II – 8.2.9.1.1** “When CPDLC is being used, and the intent of the message is included in the CPDLC message set contained in the PANS-ATM, Appendix 5, the associated message shall be used”;
 - **Annex 10 Volume II – 8.2.9.5.2** “When considered necessary by the appropriate ATS authority, additional pre-formatted free text messages shall be made available to the controller for those occasions where the CPDLC message set contained in the PANS-ATM does not provide for specific requirements. In such cases, a list of pre-formatted free text messages shall be established by the appropriate ATS authority, in consultation with operators and other ATS authorities that may be concerned.”
 - **Annex 10 Volume II – 8.2.11** “The use of free text messages by controllers or pilots, other than pre-formatted free text messages referred to in paragraph 8.2.9.5.2, should be avoided. *Note.— Whilst it is recognized that non-routine and emergency situations may necessitate the use of free text, particularly when voice communication has failed, the avoidance of utilizing free text messages is intended to reduce the possibility of misinterpretation and ambiguity.*”
- 2.4 While the Annex and PANS/ATM Doc 4444 are silent on the meaning of pre-formatted messages the Global Operational Data-link Document (GOLD) offers the following guidance:
- **Free text message element.** (Usually referred to as a free text message) A message element whose content is variable, i.e. composed by the sender. The ATS provider may construct a set of preformatted free text messages to relieve controllers of the burden of repeatedly composing commonly used messages. Such a set should include an explanation as to the intended meaning of each message.

- **Preformatted free text message.** A standardized free text message that is created and formatted automatically by the aircraft system or ground system, so that the content may be used by the message recipient's automation.
- **Standard message element.** Any message element defined by ICAO Doc 4444 that does not contain the [free text] parameter.
- **Standardized free text message.** A free text message format that has been agreed by the stakeholders as a message that should be used for the purpose/intent shown in this document.

Current ADS-B ITP Procedure

- 2.5 The proposed ADS-B ITP will be implemented in non-radar oceanic airspace. In ITP the manoeuvring (trailing or leading) aircraft flight crew appropriately qualified in the ADS-B ITP procedure obtains the flight identification, altitude, position and ground speed of the non-manoevring (leading or trailing) aircraft from ADS-B data. Based on the processed ADS-B data from the non-manoevring or reference aircraft, a pilot can make an ITP request to ATC. This request is made using CPDLC and constructed using standard message elements and standardized free text. The request will include the aircraft identification of any reference aircraft (i.e. potentially blocking aircraft that meet the ITP criteria) and the ITP Distance. An example of this is as follows:

***REQUEST CLIMB TO FL360
ITP 25NM BEHIND SIA228 AND 21NM AHEAD OF AFR008***

- 2.6 Since the procedures are designed for use in a mixed environment (where there may be aircraft with and without ADS-B transmitters), the controller maintains separation responsibility at all times. The controller who is also appropriately qualified in the ADS-B ITP procedure will first assess the request against standard separation criteria, and if these cannot be met the situation will then be assessed using ITP criteria. The controller may issue an ITP climb or descent clearance if these ITP criteria are met. The clearance is made using CPDLC and constructed using standard message elements and standardized free text. An example of this is as follows:

***ITP BEHIND SIA228 AND AHEAD OF AFR008
CLIMB TO FL360
REPORT LEVEL FL360***

Use of Free text in the ADS-B ITP procedure

- 2.7 In the current ICAO guidance the use of free text other than through the use of pre-formatted message elements should be avoided to reduce the possibility of misinterpretation and ambiguity. Airways New Zealand contention is that the standardised free text elements as defined for the ADS-B ITP procedure provide the same level of protection against misinterpretation and ambiguity as identical pre-formatted elements when crews and controllers are appropriately trained. The use of pre-formatted messages and systems automation will certainly assist controllers and

flight crews in message construction but in our opinion this has little if anything to do with misinterpretation and ambiguity.

- 2.8 Airways New Zealand does not see a need for any restriction in the use of the ADS-B ITP procedure because of standardised free text use and has no issues with the use of free text in the manner proposed. However, Airways does recommend that during the trial period specific assessments are obtained from both controllers and pilots on the construction of the standardised free text elements. Following a successful trial it is Airways intention to automate the required free text message construct for the controllers.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Note the issues regarding interpretation of ICAO Annex provisions and the use of free text in the ADS-B ITP procedure.
- b) Agree the Airways New Zealand contention that standardized free text elements in the ADS-B ITP procedure provide the same level of protection against misinterpretation and ambiguity as pre-formatted elements.
- c) Agree the use of the proposed standardized free text elements in the ADS-B ITP procedure.
- d) Recommend that ICAO amend Annex and PANS-ATM provisions and incorporate standardized free text terminology as additional means to mitigate misinterpretation and ambiguity in free text.
- e) Agree that the use of free text is an important and necessary part of CPDLC.