



International Civil Aviation Organization

The Combined Sixth Meeting of the FANS Implementation Team, Bay of Bengal (FIT-BOB/6) and the Third Meeting of the FANS Implementation Team, South-East Asia (FIT-SEA/3)

Bangkok, Thailand, 22 - 25 November 2005

Agenda Item 6: Data Link monitoring requirements

**ICAO OPLINK PANEL (OPLINKP)
CPDLC GUIDANCE MATERIAL**

(Presented by the Secretariat)

SUMMARY

This paper presents the final version of CPDLC guidance material developed by the ICAO Operational Data Link Panel (OPLINKP). The OPLINK Panel has recommended that ICAO publish this document as a matter of urgency.

1. INTRODUCTION

1.1 During the last seven years or so, a number of States and airlines have implemented CPDLC systems for communication in areas outside normal direct voice communications, as well as areas within VHF coverage as a supplement to voice. Initially, there was little in the way of CPDLC knowledge or any existing procedures that could be adapted to assist the early implementers of CPDLC.

1.2 Over the years there have been many lessons learned in the use of CPDLC. These lessons relate to ATC procedures, pilot procedures, technical specifications as well as the human machine interface (HMI) for constructing and displaying CPDLC messages. A lot has also been learned about the human factors associated with the *reading* of a text message as opposed to *hearing* it. It is important that this information is made widely available to any future CPDLC-users.

1.3 In response to reports of widespread misunderstanding of the use of CPDLC, the Secretary of the ICAO Operational Data Link Panel (OPLINKP) requested that the panel develop a document containing guidance material for the use of CPDLC.

2. DISCUSSION

2.1 Version 1.3 of the draft CPDLC Guidance Material, as presented to OPLINKP Working Group B in Montreal during February 2005, was provided to FIT-BOB/5 and FIT-SEA/2 in April 2005 for review.

2.2 Since then, work on this document has been progressed through two further meetings OPLINKP working group meetings and, following considerable review and update, Version 1.4 was presented to the First full meeting of the OPLINK Panel (OPLINKP/1) in September 2005 for consideration. The OPLINKP/1 meeting recommended that ICAO publish the guidance document as a matter of urgency.

2.3 The CPDLC guidance material provides a compendium of various procedures, guidance on individual CPDLC message element use, anecdotes and lessons learned, as well as other information that may be useful when implementing or utilizing CPDLC. It is a non-technical document, aimed primarily at pilots and air traffic controllers, although there is also information that may be of interest to other parties, e.g. avionics and ground system manufacturers.

2.4 The introductory pages of the CPDLC guidance material are **attached** to this information paper. The document consists of two parts:

- a) Part 1 contains general guidance, procedures, training and automation issues; and
- b) Part 2 contains guidance on specific CPDLC messages.

2.5 It is anticipated that the CPDLC guidance material has the potential to reduce error rates, as well as standardizing procedures over a number of regions. The material also includes concepts that may be beneficial if incorporated into future CPDLC-systems.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the availability of the CPDLC guidance material.

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CPDLC Guidance Material

Version 1.4

Last saved: 18-Nov-05

Revision History		
Title	Release	Presented at:
Initial Draft	0	Montreal Mar 2004
New version, adding further concepts, expansion on placeholders and incorporating comments received prior to Toulouse meeting	1.1	Toulouse Sep 2004
Incorporation of comments and discussions emanating from Toulouse meeting	1.2	Not presented
Incorporation of comments and discussions post – Toulouse. Addition of extra text.	1.3	Montreal Feb 2005
Incorporation of comments and discussions post – Montreal. Deletion of incomplete sections. Addition of extra text.	1.4	OPLINKP/1 Montreal Sept 2005

About this document

CPDLC Guidance Material is intended as a document that will be useful for both air traffic controllers and flight crew. There is also information that may be pertinent and of benefit to airline operators as well as software and avionics manufacturers.

The information in this document has been collated based on observations and problems encountered during several years of CPDLC operations in the South Pacific and North Atlantic, as well as during the implementation of CPDLC in Europe and the United States. It is intended that this is a “living document” – as further operational experience is obtained it can be added as required. This is not a training document per se, but could be used to build the foundations for a training programme, or for development of procedures.

Material in this document should be read in conjunction with documents containing relevant regional procedures, local procedures, as well as ICAO documents such as PANS-ATM Doc 4444 and Doc 9694 *The Manual of Air Traffic Services Data Link Applications*.

Whilst acknowledging that FANS-1/A is not an ICAO SARPS compliant system, there are references throughout this document to this technology. FANS-1/A has provided an excellent introduction to CPDLC for a number of States, airlines, and aircraft manufacturers. Numerous lessons have been learnt ranging from problems with regard to controller and pilot training, automation issues, message display problems, and other associated human factors issues. The lessons learnt from FANS-1/A and other ATS data link systems (e.g. ACARS) should not be ignored, as they provide an invaluable basis for further development.

The information in this document is generally aimed at being technology independent. However where appropriate, there may be references to specific FANS or ICAO CPDLC technologies within this document.

Layout of document

This document is divided into two Parts.

Part I of this document describes general procedures and principles on various topics that should be considered when implementing or using a CPDLC system for communication. The topics covered include:

- Description of CPDLC
- Procedures
- Training
- Automation
- Human Factors

Part II contains specific guidance material for various CPDLC uplink and downlink message elements. This is intended to clarify the intent of the use of some of the message elements, as well as documenting some of the problems and lessons learnt from FANS-1/A. The need for this clarification is evidenced by the contents of various CPDLC related incident reports that have been submitted over the years.

This section does not provide guidance on every single CPDLC message element – it is limited to those message elements that have caused identified as causing problems. As the usage of CPDLC becomes more widespread and is applied in different environments, it is expected that more guidance material for additional message elements will be required.