



Federal Aviation Administration (FAA)

CHANG MAI - ATN SEMINAR

CPDLC OVERVIEW

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- **ATN End System Support**
- Application ASEs
 - CPDLC, CM, ADS, FIS
- Fast BYTE Session & Presentation Layers
- CO and CL Transport Layer
- CL Network Layer
- ES-IS Routing





- CLNP
- Protocols Recommended
 - ES-IS







- Connection Mode Protocol
- Ensures end-to-end Reliable Delivery
- Provides a Checksum on each Packet
- Retransmits on Packet Loss or Corruption
- Provides End-to-End Flow Control





- Created by Sender
- Sender sends it and forgets it
- Interpreted by Routers
- Delivered to Destination System







- Simple Datagram Format
- Message Header Identifies
 - Source and Destination
 - Priority
 - Traffic Type
 - AOC Routing Requirements
 - ATSC Class









CPDLC allows two way communication between pilot and controller, but using data link rather than voice









CPDLC Functions



- Creation of a dialogue between pilot and controller, ground or air initiated
- → Passing messages selected from ICAO standard list
- → Ability to use free text if required
- Freedom to communicate with a non-controlling authority for the purposes of getting future clearances
- Transfer of communication between control authorities by data link, rather than voice

Compatibility with Voice Phraseology



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'The CPDLC Application must include a set of clearance/information/request message elements which correspond to voice phraseology employed by ATC procedures'











A CPDLC Message is composed of -

- a. The Message Header, plus
- b. Message Element 1, plus (optionally)
- c. Message Element 2, plus (optionally)
- d. Message Element 3, plus (optionally)
- e. Message Element 4, plus (optionally)
- f. Message Element 5.



Controller-Pilot Message Exchange Function

Transfer of Data Authority Function

Down Stream Clearance Function

Ground Forward Function



- > CPDLC-message service
- CPDLC-end service
- DSC-end service
- CPDLC-forward service



- WILCO (No Parameters)
- > Affirm (No Parameters)
- AT [time] EXPECT CLIMB TO [level]
- CLEARED [route clearance]
- > SQUAWK MODE CHARLIE

REPORT REMAINING FUEL AND PERSONS ON BOARD









Benefits from use of CPDLC



- To improve SAFETY by -
 - Reducing risk of controller-aircrew misunderstandings
 - **Reducing** congestion on voice channels
 - Reducing risk of failure in the transfer of information
- To improve **ATM EFFICIENCY** by -
 - Increasing controller/aircrew productivity
 - Enabling automation
 - Providing concise and precise exchanges between controller and aircrew
 - **Reducing** the voice communication workload