INTERNATIONAL CIVIL AVIATION ORGANIZATION

WESTERN AND CENTRAL AFRICA OFFICE

Thirteenth Meeting of the FANS I/A Interoperability Team (SAT/FIT/13)

Durban, South Africa, 4-5 June 2018

Agenda Item 4: **System performance monitoring and maintenance**
c: Problem identification, reporting and resolution procedures

IMPROPER USE OF CERTAIN PRE-FORMATTED CPDLC MESSAGE ELEMENTS
(Presented by ASECNA)

SUMMARY
This paper provides some awareness on the hazardous use of some CPDLC messages. The use of some pre-formatted CPDLC message elements as conventional expression during exchanges between Air Traffic Controllers and Pilots, in many reported cases can be confusing and may lead to a dangerous situation, for the flight. It is recommended to use such message elements only when the meaning and scope are well mastered. The purpose of this paper is to pick up messages the use of which is not recommended (ref. Doc 10037 appendix A)
REFERENCE(S): (ICAO. Doc 10037 appendix A)
Related ICAO Strategic Objective(s): Strengthen civil aviation safety worldwide

1. INTRODUCTION:

Some major safety issues, related to the use of Controller Pilot Data Link Communications (CPDLC) may arise in different cases. While CPDLC is expected to contribute to an improved safety flight operation, there are some circumstances that could lead to hazardous occurrences, unless properly addressed.

Analysis of the current situation states that a great number of improper CPDLC messages elements are being used mainly by air traffic controllers and pilots. It is absolutely necessary to identify some best practices for CPDLC users (both pilots and controllers) and provide some mitigation actions to be taken, if safety is threatened.

2. DISCUSSION:

With CPDLC it is possible to transmit a wrong message to an aircraft or to transmit a message to the wrong aircraft. The most common circumstances that lead to an inadvertent use of unexpected, inappropriate or ambiguous CPDLC message are when:

- relaying messages,
- answering to requests,
- delivering traffic information…

As an illustration, considering a request from a flight to climb to FL350 or FL370 due to its aircraft performances; as a respond, the ATC issued that followed clearance*: **«cruise climb to FL370",*** whilst it was expected from the traffic to expedite its climb.
Such "cruise climb to" clearance allows a flight to evolve in stages, from 100 to 200 feet as its weight decreases and the optimum level increases to its cruising level.

Meanwhile crew should clarify such unexpected clearance.
This situation may be caused by the existence of a huge number of pre-formatted messages per section, making it difficult for the controller or pilot to find easily the suitable pre-formatted message. The absence of pre-formatted messages to be used in some particular situations may contribute to the event.
As mitigation, this following table attached in annex provides message elements recommended not to be used, (ref. Doc.10037 appendix A).

3. ACTION BY THE MEETING:

3.1 The SAT/FIT13 meeting is invited to:

- consider this set of pre-formatted CPDLC messages, frequently used and that can be confusing.
- mitigate the risk of misinterpretation as far as contains and intent of uplink or downlink messages which are concerned.

-END-

ANNEX TABLE: FANS 1/A uplink message elements

Message element	Justification
CROSS (position) AT AND MAINTAIN (altitude)	Avoid use of this message due to inability of aircraft automation to maintain the altitude restriction.
AT (time) CROSS (position) AT AND MAINTAIN (altitude)	
EXPECT (route clearance)	Avoid use of this message element due to potential misinterpretation
AT (position) EXPECT (route clearance)	
EXPECT DIRECT TO (position)	
AT (position) EXPECT DIRECT TO (position)	
AT (time) EXPECT DIRECT TO (position)	
AT (altitude) EXPECT DIRECT TO (position)	
SERVICE UNAVAILABLE	
EXPECT (altitude)	
EXPECT CRUISE CLIMB AT (time)	
EXPECT CRUISE CLIMB AT (position)	
AT (time) EXPECT CLIMB TO (altitude)	
EXPECT (altitude)	
AT (position) EXPECT CLIMB TO (altitude)	
AT (time) EXPECT DESCENT TO (altitude)	
AT (position) EXPECT DESCENT TO (altitude)	
AT (time) EXPECT CRUISE CLIMB TO (altitude)	
AT (position) EXPECT CRUISE CLIMB TO (altitude)	
CRUISE (altitude)	
CRUISE CLIMB TO (altitude)	
CRUISE CLIMB ABOVE (altitude)	
IMMEDIATELY STOP CLIMB AT (altitude)	
IMMEDIATELY STOP DESCENT AT (altitude)	
REPORT REACHING (altitude)	
EXPECT TO CROSS (position) AT (altitude)	
EXPECT TO CROSS (position) AT OR ABOVE (altitude)	
EXPECT TO CROSS (position) AT OR BELOW (altitude)	
EXPECT TO CROSS (position) AT AND MAINTAIN (altitude)	
AT (time) EXPECT (speed) TO (speed)	
AT (position) EXPECT (speed) TO (speed)	
THEN	
ROGER **7500**	
DISREGARD	Not operationally required.
MAINTAIN OWN SEPARATION AND VMC	
WHEN CAN YOU ACCEPT (specified distance) (direction) OFFSET	
DO NOT EXCEED (speed)	
CONFIRM ATIS CODE	
TRANSMIT ADS-B IDENT	Use of SQUAWK IDENT is recommended
IDENTIFICATION TERMINATED	Use of SURVEILLANCE SERVICE TERMINATED is recommended.
CONFIRM POSITION	Use of ADS-C is recommended.
CONFIRM ALTITUDE	
CONFIRM TIME OVER REPORTED WAYPOINT	
CONFIRM REPORTED WAYPOINT	
CONFIRM NEXT WAYPOINT	
CONFIRM NEXT WAYPOINT ETA	
CONFIRM ENSUING WAYPOINT	
REPORT GROUND TRACK	
REPORT DISTANCE (to/from) (position)	
CONFIRM HEADING	
AT PILOTS DISCRETION	Not globally accepted