# PR Review

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# ATC messages with timestamp in the future

## CONTEXT

ATC centers reported downlinks with timestamp in the future.

Two different types:

- Detected (PR 1620)
  - Low FOM indicates loss of time synchro for ADS-C reports
  - These events can be detected directly by controler if FOM value is displayed

- Undetected (PR1397, 1587, 1894 and CNSG13 IP06, 24 + WP13)
  - No degradation of the FOM
  - These events are detected a posteriori

Remark

- Timestamp in the future are detected but undetected timestamp deviations in the past might also occur (as unduly considered as communication means delay)

# ATC messages with timestamp in the future

1) Undetected: CPDLC and AFN only affected. ADS-C not affected

ADS-C timestamp comes from a different source than CPDLC and AFN

Current assumption (TBC): Depending on some A320/A330/A340 aircraft configuration, if the clock is not GPS synchronized, FMS and FANS system may not be synchronised on the same source (GPS). In such a case, CPDLC and AFN may use a not synchronised a/c clock whereas the ADS (using FMS data) remains GPS synchronised.

Occurrences with ADS-C not affected can still be reported
Airbus will check that aircraft reported are in the expected configuration
This will validate the analysis

# ATC messages with timestamp in the future

## 2) Undetected: CPDLC, AFN and ADS-C affected

Still under investigation

**To support investigation, ATC cooperation is needed**:

- Report occurrences, FOM values and aircraft immatriculation of timestamp in the future when ADS-C is affected

- Aircraft flight data recorder also contains data needed for investigation but it is quickly erased. In case of live occurrence please contact Airbus as soon as possible (+ 33 6 8383 8812 / marine.glimois@airbus.com)

# North Atlantic PRs

# PR not investigated

- Traces not yet received

PR 2153: A330 - MAS received but no downlinks received for aircraft

PR 2154: A330 - MAS received but no downlinks received for aircraft

PR 2122: A388 reports Protocol Error

- Traces received but PR still under investigation

PR 2121: A333 reports Protocol Error

PR 2103: A330 - Multiple NAKs and Not CDA from Aircraft

PR 1954: A330 - FANS Connection Continuously Disconnects

- No traces for investigations:

PR 1928: A330 - Stale reports sent to aircraft -> similar to PR 1931

# PR 1913 : A388 fails to ACK uplinks and sent 'Insufficient message storage capacity' on the 5th Greeting UM msg

## Issue:

Reykjavik (BIRD) center reported that one A380 gave no indication of receiving greeting messages sent multiple times. After the 5th greeting message was sent a DM62 ERROR INSUFFICIENT MESSAGE STORAGE CAPACITY was then downlinked.

## Analysis:

The reception of a multi-element (UM161 + UM117) led to an onboard FANS system freeze.

Corrected on A380 FANS A+B (batch 5), this standard is currently being retrofitted.
A320/A330/A340/A350 aircraft are not impacted

# PR 1931: A333 Stale reports sent to aircraft

## Issue:

NAV Canada reported that one A330 crew complained they were receiving erroneous messages from a previous flight flown the night before.

## Analysis:

The air/ground traces does not show any datalink misbehaviour nor erroneous messages being sent.
A similar occurrence (PR 1928) was reported by NAV Canada a few days before.

Airbus recommend an analysis by the DSP.
Were other similar occurrences reported in the same period?

# PR 2102 : A332 Invalid field in predicted route

## Issue:

NAV Canada reported an A330 sent 40W report with invalid fields in the predicted route. All other waypoints and periodic reports showed correct values.

14:34:43 - WAYPOINT CHG [5102.1N/04001.4W] [37000 FT] [143426] [6] [3]

14:34:43 - PREDICTED ROUTE [18000.0S/18000.0W] [] [043303] [18000.0S/18000.0W] []

## Analysis:

On FANS CSB/CLR7.2 standards (for A320, A330 or A340 ), if predicted data from the FMS are not available, the data in the predicted group will all be invalid (including these that are not predicted e.g. Lat/Long).
This will be corrected in the next standard: ATSU CSB/CLR7.4.
This standard will also reduce the number of invalid predictions sent in the On Event report.

Correction S2 2016
Free of charge retrofit of CSB/CLR7.2 into CSB/CLR7.4

# South Pacific PRs

# PR not investigated

- Traces not yet received

PR 2156: Aircraft received CPDLC message not sent by ATC - A332

PR 1912: Uplinked CPDLC route clearance - No LOAD prompt or error message - A332

- Traces received but PR still under investigation

PR 2159: Incorrect ADS-C estimate - A332

PR 1960: A330 - Downlinks not received - A332

# PR 1938: Active CDA maintained after disconnecting CPDLC – A332

**Issue:**

Air Services Australia reported that even if an “inactive” connection (CR + CC) could be established with the aircraft, no operational connection could be established.

After disconnection with NZZO the crew reported that NZZO was still displayed as the active ATC center.

The crew could not send CPDLC position report.

**Analysis:**

The analysis was based on incomplete logs as HF logs were not provided by the airline.

The analysis of air/ground traces confirms that the crew could not respond to any CPDLC uplink until a manual reset of the on board FANS system.

The root-cause of the issue could not be identified

ATSU standard CSB/CLR7.2
UNDER MONITORING

# PR 1902: A330 - No WCE downlinked following change to Next + 1 - A332

## Issue:

- Air Services Australia reported that the crew manually inserted a route clearance in their FMS. Following the route conformance check the route was manually updated by the crew.
- However no subsequent ADS-C report was generated whereas a WCE should have been generated when Next + 1 (ISTEM) was changed to WARTY.
- A Demand Contract Request confirmed that the Next + 1 had been corrected to WARTY.

## Assumption:

- Waypoints manually and sequentially inserted (most likely) inserted in the FMS. (Automatic Load function is recommended).
- 2 consecutives frames (in less than 10 seconds) from the FMS with a waypoint change are not detected

AS PER DESIGN TO AVOID DUPLICATED WAYPOINT CHANGE
HOWEVER IMPLEMENTATION CHANGE UNDER STUDY

# PR 2124 : CPDLC error messages received in response to an EXPECT uplink - A380

## Issue:

Air Service Australia reported that on receipt of an EXPECT uplink it appears that some A380s responded with an error message.

## Analysis:

As per latest GOLD version, in new FANS products (A380 FANS A+B, batch 5 and A350), UM42 or 43 messages are no longer supported and are answered with an Error Message (invalid data).

In addition, the following messages are also no longer displayed in the ATC crew Mailbox:
UM160, UM161, UM163.
UM13, 14, 15, 16, 17, 18, 33, 40, 41, 42, 43, 44, 45, 175, 178 are stated as ‘reserved’ in ICAO document 4444, and ‘reserved’+ ‘Avoid use’ in ED122, and in ICAO document GOLD v2.0.
As such, they also are no longer displayed to the crew and once received an onboard error message is sent to the ATC ground center.

As per GOLD recommendation, these messages should no longer be used

# PR already presented and updated

# PR 1514 – Loss of CPDLC, ADS-C - A332

**Issue:**

Air Services Australia reported that one A330 was not responding to CPDLC messages and that ADS-C reports were not received in time

**Analysis:**

Satcom failure with one Satcom manufacturer (Rockwell-Collins)

Satcom dropped off in flight and got back few minutes later

"Known" Rockwell-Collins Satcom failure
Correction expected for Q3 2016