Problem Report Briefing

FIT ASIA
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Rochelle Perera
Rochelle.e.perera@boeing.com

Agenda

- Introduction
- PR definition
- New Developments
- Asia region PRs
- Notable Aircraft PRs outside of Asia region

Chart 2

Introduction

- PRs filed via ISPACG-CRA, NAT DLMA Problem Reporting website: http://www.ispacg-cra.com/
  - Website hosted by Airways Corporation of New Zealand Limited
- Now used for:
  - CRA for South Pacific (ISPACG FIT)
  - CRA for North, Central, East Pacific (IPACG FIT)
  - DLMA for North Atlantic (NAT CNSG)
  - FIT-ASIA for South China Sea, Bay of Bengal, Indian Ocean
- Continue to get new entities registered with website
  - Registration: http://www.ispacg-cra.com/about.asp
  - Select "register as user"

Chart 3

PR Status Definitions

- **RAISED** - the PR has been filed by the originator but has not yet been processed by the CRA

- **ACTIVE** - CRA has processed the PR and allocated a PR # and someone to investigate it. During this phase the PR is under investigation

- **OPEN** - The CRA investigation is complete however some form of correction is required before it can be closed

- **CLOSED AS DUPLICATE** - Closed because problem is already covered/tracked under another PR
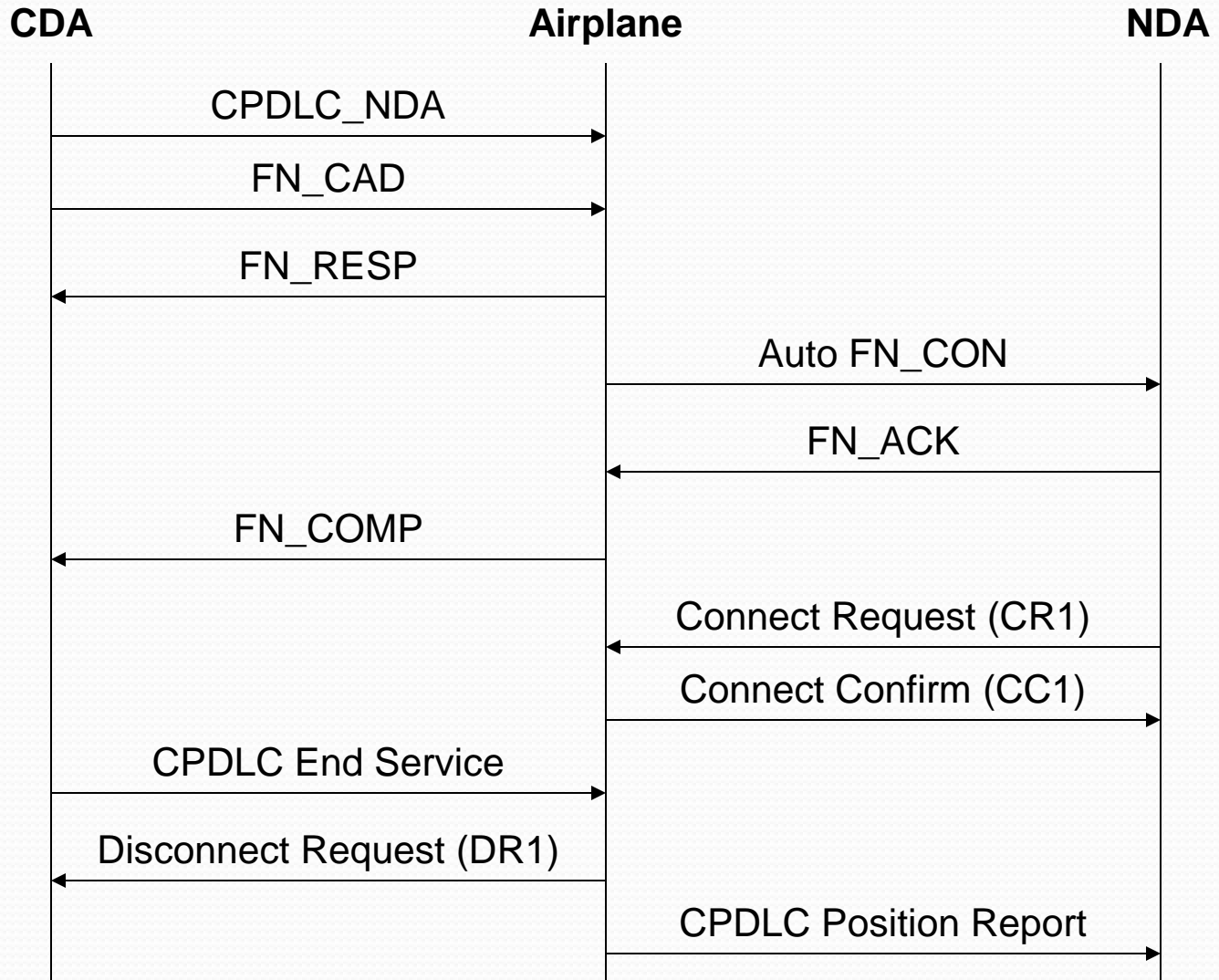
- **CLOSED** – Corrective action has been implemented

Chart 4

New Developments

- Philippines ANSP has joined the FIT and has been submitting reports very routinely

- RPHI is now supporting CPDLC services

Chart 5

Asia Region PRs

Chart 6

Transfer Process

CDA   Airplane   NDA

CPDLC_NDA

FN_CAD

FN_RESP

Auto FN_CON

FN_ACK

FN_COMP

Connect Request (CR1)

Connect Confirm (CC1)

CPDLC End Service

Disconnect Request (DR1)

CPDLC Position Report

Chart 7

1892-AG Unable to Logon to XXXX (B747-400)

Region: ASIA   Status: Open   Type: Ground

- Aircraft attempted multiple logons to center XXXX
- No AFN ack was uplinked in response to the logon, and therefore the connection could not be successfully made
- Center was contacted to address the uplink issue. PR will be closed once issue is confirmed addressed by the center

Chart 8

1893-MM – Unable to Logon (B747-400)

Region: ASIA   Status: Open   Type: Ground

- Active center began transferring aircraft to next data authority (NDA)
- Logon to NDA was successful however the active center did not uplink an End Service to complete the transfer
- Secondary issues seen with SATCOM delaying messages for several minutes.
- Active center was notified to address the issues. PR will be closed once center has confirmed the issue has been addressed.

Chart 9

1908-AG Error Messages (B747-400)

Region: ASIA   Status: Closed   Type: Air

- Active center reported that uplinks were being rejected by the aircraft
- Known issue with Rockwell Collins -003 MUs (installed on 747-400)
- When the MU receives an uplink for the FMC which exceeds it's allowable size, it will issue a Q5 rejection to the ground
- It will then continue to reject all uplinks destined for the FMC until circuit breaker/power is cycled
- Software fix is available ("core 6") however not all operators have chosen to install new the software

Chart 10

1916-AG Unable to Logon the XXXX (B747-400)

Region: ASIA   Status: Open   Type: Ground

- Aircraft logged on a total of eight times to two different centers
- In seven of the cases, one of the uplinks necessary to complete the logon was missing (either AFN ack, or CR1)
- In last case the logon process was proceeding normally, but flight crew manually terminated the process
- Centers have been contacted and PR will be closed once centers confirm issue has been addressed.

Chart 11

1925-AG Unable to logon CPDLC with XXXX (B777)

Region: ASIA   Status: Closed   Type: Ground

- Aircraft logged on multiple times to center XXXX
- Ground responded with an AFN ack but no CR1 uplink
- Final logon attempt received both an AFN ack and CR1 uplinks
- This resulted in a successful logon and CPDLC exchange worked correctly from then on.

Chart 12

1970-GS   B788 is trying to establish ADS/CPDLC connection but could not

Region: ASIA   Status: Open   Type: Network

- Analysis of the datalink logs identified missing AFN logons and ADS reports along with jumps in the MSN
- Aircraft (SITA customer) was using ARINC/AeroThai VHF stations
- AeroThai appears to have ack'd the ATC messages but not passed them on to the center
  - ARINC policy is to not ack ATC messages (thus forcing retry on different media or ground stations)
- ARINC is working with AeroThai to rectify the issue so that ATC messages are not ack'd
- Airplane also had SATCOM issues at the time
- ARINC has been contacted and PR will be closed once we have confirmation they have worked with AeroThai to rectify the issue.

Chart 13

1985-RP   Unable LOGON XXXX FIR (B777-200)

Region: ASIA   Status: Open   Type: Ground

- Aircraft sent multiple logons to center XXXX
- The ground rejected the logon with a code of 4 (FAK4)
- This code corresponds to no flight plan/ID in the system
- PR was reassigned to XXXX center for further investigation for reason for rejection
- Center has been contacted and PR will be closed once reason for rejection has been confirmed.

Chart 14

2017-MM Connection Failed (mult aircraft)

Region: ASIA   Status: Closed   Type: Ground

- Active center did not transfer connection to RPHI
- RPHI is now supporting CPDLC services
- RPHI can be transferred CPDLC authority per the normal transfer process

Chart 15

2020-SH   NO DOWNLINK MESSAGE RECEIVED (B767-300)

Region: Asia   Status: Closed   Type: Air
                             as Duplicate

- Active center reported missing downlinks from aircraft
- Issue identified with Rockwell Collins CMU (core -12) software
- CMU acknowledges receipt of an uplink intended for the FMC but then tosses the message instead of delivering it
- Often referred to as "ack-n-toss" issue (ref chart 24)
- Currently under investigation by Rockwell Collins
- CMU core 12 is available on models 737, 767 and 747
- Master PR 1684-MM

Chart 16

2022-SN CPDLC Connected ADS-C not connected (A330)

Region: Asia   Status: Open   Type: Network

- Center reported having CPDLC connection but could not establish ADS-C connection
- Center uplinked ADS-C contract 0 over SITA (ANSP subscribed only to SITA)
- Aircraft responded with ADS contract acknowledgement and first periodic report on ARINC HF
- ARINC did not forward the message to SITA
- Even if ANSP is not a customer of both SITA and ARINC, messages sent on other DSP network should be routed to SITA to route to the ANSP (internetworking)
- ARINC has been contacted regarding the issue. PR will be closed once we receive confirmation that the issue has been addressed.

Chart 17

2088-MM CPDLC connection failure (B767-300)

Region: Asia   Status: Closed   Type: Air
                                as Duplicate

- During one flight leg, multiple centers uplinked a CR1 and the aircraft downlinked a DR1 with DM64 [icaofacilitydesignation] with a value of four space characters (<sp> <sp> <sp> <sp>)
- One scenario for this is when the CPDLC application does not get a valid initial AFN ack.
- Other scenarios are currently under investigation
- Master PR 1877-MM

Chart 18

2132-SH Unable to establish connection with XXXX (B777)

Region: Asia   Status: Closed   Type: Air

- Active center uplinked a DR1 to terminate it's CPDLC connection
- The aircraft avionics look to have acknowledged this uplink, but not transferred it to the CPDLC application
- All subsequent connection requests were rejected by the aircraft because it was still connected to previous center
- Similar to issue seen on Rockwell Collins CMU, but this is specific to Honeywell AIMS software
- Fix available in AIMS BP17.1

Chart 19

2163-SH Could not connect CPDLC with XXXX (A380-800)

Region: Asia   Status: Open   Type: Air

- Aircraft reported they could not use CPDLC with a certain center
- Datalink logs show that CPDLC connection was successfully established
- Active center uplinked several messages with no time stamp included.
- Each uplink triggered an automatic error downlink
- Error information indicates the flight crew had entered a value for uplink delay timer in their CPDLC application and due to missing timestamp, this triggered an error
- Airbus is following up with airline to discuss issue. PR will be closed once we receive confirmation the issue has been addressed.

Chart 20

737 FMS resets due to ADS intent group

- Several reports of FMS resets while in descent
- Data analysis shows that the FMS can reset if active ADS contract has Aircraft Intent group requested and the aircraft is performing a descent from high cruise altitude to a low altitude waypoint (ie from a cruise altitude of FL380 to the next waypoint with a constraint of 5800A)
- FMS does recover after reset
- Aircraft Intent group data is not widely used
- Requesting ANSPs who are using Intent group to speak with Boeing
- Fix will be available with next FMS update (U13) currently estimated to be available second half of 2017

Chart 21

Notable Airplane PRs

Chart 22

"Ack-n-Toss" PRs

Region: Mult   Status: Active   Type: Air

- CRA has received 17 PRs in which "Ack-n-Toss" has been a contributor
    - Also several reports from FAA Data Comm program
  - Reported events involve multiple airplane models
  - Common denominator is Rockwell-Collins CORE -012 CMU
- Rockwell- Collins (RCI) has not yet reproduced problem in lab
- RCI concurs that problem is in CMU
- RCI requests operators experiencing issue to provide CVR data (if they have datalink recording capability)
- PR will be closed once a fix for this issue is available for incorporation.

Chart 23
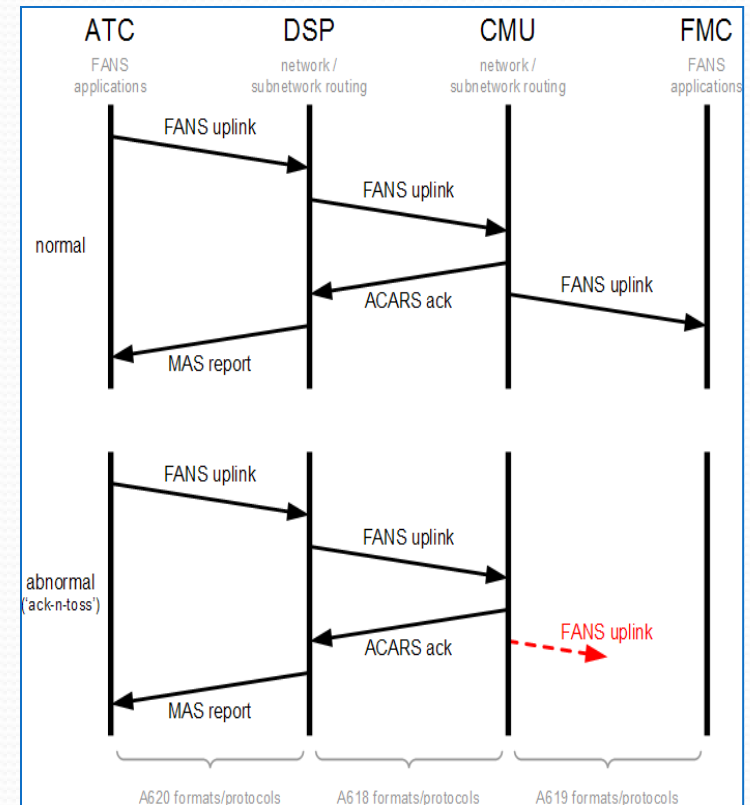
1645-RP - No CPDLC downlinks from 747-8

Region: SOPAC

Status: Closed as Duplicate

Type: Air

- While aircraft was connected to center, CPDLC uplinks worked correctly, but flight crew unable to respond to uplinks
- ADS was not affected, uplinks/downlinks continued to work correctly
- Suspect issue is internal to Honeywell NG FMS (installed on 747-8/747-400)
- Suspect issue is also related to multiple downlinks of Wilco/Unable
- Currently collaborating with an operator to collect data
- 1763-RP is the "master PR" for this problem

Chart 24

1855-GS - CPDLC route request from B788 commenced at an ATS route

Region: SOPAC   Status: Open   Type: Air

- Flight requested an amended route via CPDLC
- The first element in the route clearance field was an airway
- Per Honeywell investigation, whenever airplane is on the last leg of an airway, then route downlinks (route request, or the response to CONFIRM ASSIGNED ROUTE) will begin with the airway
- 777 behaves this way, too (787 behavior was "inherited" from 777 code)
- PR will be closed once a fix for this issue is available for incorporation

Chart 25

1989-SN - Repeated CPDLC Messages   (B777)

Region: NAT   Status: Open   Type: Air

- More than 60 CPDLC "WILCO" downlinks were received and did not stop until the flight disconnected

- When flight crew disconnected, more than 57 "ERROR : ERROR [Command termination] and then "Cpdlc disconnection due to : : ERROR [Appliction Error]" CPDLC messages were received

- Problem is a probable duplicate of 1490-SN (2014) and others

- Problem is still under investigation by Boeing and Honeywell

- ANSPs should report any instance of this behavior for further investigation

- PR will be closed once root cause has been identified and fix/change is available for incorporation

Chart 26

2070-RP - Invalid position in AFN logon of B748

Region: SOPAC   Status: Open   Type: Air

- B748s (and B744s with NG FMS) sometimes send AFN logon with invalid position
- Problem also observed with other non-Boeing aircraft (e.g. GLF4)
- Boeing has reproduced the problem in the lab
- Note that the Honeywell NG FMS is used on B748's, B744s, and other non-Boeing aircraft, including Gulfstream models
- PR will be closed once fix for this issue is available for incorporation

Chart 27

2001-SN - Route Clearance when appended to FreeText Uplink   (multiple biz jets)

Region: NAT   Status: Open   Type: Air

- When an uplink contains a route clearance appended to free text, the flight crew are unable to review and accept the clearance
- Although the PR was observed initially with a gulfstream, the problem is internal to Honeywell NZ 6.1 FMS which is available on multiple business jets
- No issue if a clearance is sent with freetext appended to the clearance
- Software updates unlikely for some aircraft and unlikely anytime soon for others.
- PR will be closed once fix is available for incorporation

Chart 28

1913-SN   A388 fails to ACK uplinks and sent 'Insufficient message storage capacity

Region: NAT   Status: Closed   Type: AIR

- Report that one A380 gave no indication of receiving greeting messages which were sent multiple times.

- After the 5th greeting message was sent a DM62 ERROR INSUFFICIENT MESSAGE STORAGE CAPACITY was then received.

- Analysis showed that the reception of a multi-element: UM161 + UM117 (W/U message) led to an onboard FANS system freeze.

- Corrected on A380 FANS A+B (batch 5), this standard is currently being retrofitted.

2102 : A332 Invalid field in predicted route

Region: NAT   Status: Closed   Type: AIR

- Report that an A330 sent an ADS-C 40W report with invalid fields in the predicted route. All other event and periodic reports showed correct values.

- 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.

- Fix will be available in second half of 2016

Ref: Data from Airbus PR Review presentation , April 2016

Chart 30

2124- SN CPDLC error messages received in response to an EXPECT uplink (A380)

Region: SOPAC   Status: Closed   Type: Ground

- Report on receipt of an EXPECT uplink it appears that some A380s responded with an error message.

- 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).

- 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

Chart 31

Interoperability Testing

- Offered through the Boeing Company (outside of CRA responsibilities)
- Interoperability testing with ANSPs allow for live testing of the system using actual networks (Sita/Arinc) and real Avionics (Boeing test facilities)
- Allows for detection of issues prior to going live
- Can provide a generic interoperability test or do a test more tailored to each ANSP
- Contact: rochelle.e.perera@boeing.com for questions about interoperability testing or to schedule a session

Chart 32

Questions?

Chart 33

Backup

Chart 34

Table 1- Fixed Avionics PRs

PR	System	Description	Status	Notes
1021-MM	737, 747, 757, 767, MD-11	Rockwell Collins CMU-900 "peripheral lockup" issue	CLOSED	CLOSED with availability of Rockwell Collins CMU-900 core software part number 832-9548-012
1145-SN	777	777 unable to send messages after CPDLC transfer	OPEN	To be CLOSED with availability of 777 AIMS-2 BPV17A software
1229-SN	A330/A340	A330/A340 ADS-C predicted route group issues	CLOSED	CLOSED with availability of A330/A340 next FANS A+ standard
1358-MM	777	777 "ack-n-toss" issue (ACARS avionics acknowledge receipt of FANS uplinks but do not deliver them to the FANS avionics)	CLOSED	CLOSED with availability of 777 AIMS-2 BPV17.1 software
1405-GS	787	787 loses SATCOM link after losing VHF Cat B link	CLOSED	CLOSED with availability of 787 CMF BP2.5 software
1480-SN	MD-11	MD-11 sends unexpected ADS-C lateral deviation report	CLOSED	CLOSED with availability of MD-11 FMC -922 software
1534-GS	787	787 does not respond to AFN uplink messages	CLOSED	CLOSED with availability of 787 CMF BP2.5 software
1540-SN	A380	A380 avionics reset when aircraft is climbing and flight crew sends a position report with the CLIMBING TO element	CLOSED	CLOSED with availability of A380 FANS A+B Batch 5 software
1556-GS	787	787 sends CPDLC disconnect request or no response to CPDLC connect requests	CLOSED	CLOSED with availability of 787 CMF BP3 software

Chart 35

Table 1- Fixed Avionics PRs continued

PR	System	Description	Status	Notes
1585-GS	787	787 does not respond to ADS-C uplink messages	CLOSED	CLOSED with availability of 787 CMF BP2.5 software
1644-SN	A380	A380 sends duplicate responses to uplink messages received via different media	CLOSED	CLOSED with availability of A380 FANS A+B Batch 5 software
1726-RP	747-8	747-8 Inmarsat Classic Aero SATCOM avionics issues	CLOSED	CLOSED with availability of Rockwell Collins SDU-2200 part number 822-2556-103
1760-GS	787	787 SATCOM avionics issues	CLOSED	CLOSED with availability of 787 CMF BP3 software
1762-GS	787	787 message delays due to avionics message queuing issues	CLOSED	CLOSED with availability of 787 CMF BP2.5 software
1798-GS	787	787 fails to send armed MAINTAINING [altitude] reports	CLOSED	CLOSED with availability of 787 CMF BP3 software
1854-SN	A330/A340	A330/A340 responds to STANDBY with ERROR UnrecognizedMsgReference Number if STANDBY includes embedded ACARS acknowledgement to request	CLOSED	CLOSED with availability of A330/A340 CSB/CLR7.3 software
1881-SN	A330/A340	A330/A340 sends ADS-C reports with zero time-to-go	CLOSED	CLOSED with availability of A330/A340 FMS300 REL1A software
1885-SN	A330/A340	A330/A340 sends duplicate responses to uplink messages received via different media	CLOSED	CLOSED with availability of A330/A340 CSB/CLR7.3 software

Chart 36

Table 1- Fixed Avionics PRs continued

PR	System	Description	Status	Notes
1913-SN	A380	A380 does not allow CPDLC downlink responses to CPDLC uplink messages	CLOSED	CLOSED with availability of A380 FANS A+B (Batch 5) software
1923-RP	747-8	747-8 (or 747-400 with 747-8 FMC) responds to CPDLC connect request with CPDLC disconnect request	CLOSED	CLOSED with availability of 747-8 FMC BP3.1 software
1943-RP	747-8	747-8 (or 747-400 with 747-8 FMC) AFN protocol errors	CLOSED	CLOSED with availability of 747-8 FMC BP3.1 software
1953-MM	A330/A340	A330/A340 sends duplicate waypoints in route request	CLOSED	CLOSED with availability of A330/A340 P4 (Step1A) software
2102-MM	A330/A340	A330/A340 sends invalid value in ADS-C predicted route group	OPEN	To be CLOSED with availability of A330/A340 CSB/CLR7.4 software

Chart 37