



FIT ASIA Central Reporting Agency –Problem Report Briefing

Rochelle Perera

Rochelle.e.Perera@boeing.com

August 2021

Agenda

- Introduction
- PR definition
- Asia region PRs
- Notable PRs outside of Asia region
- Other Issues

Introduction

- ATS stakeholders can file PRs for investigation on the following site:
<http://www.fans-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 TIG)
 - FIT-ASIA for South China Sea, Bay of Bengal, Indian Ocean
- Continue to get new entities registered with website
 - To register, select “sign up” on the top right of the website.
- De-identified reports starting from 2016 are also available for viewing
- This website also hosts the PBCS charter

PR Status Definitions

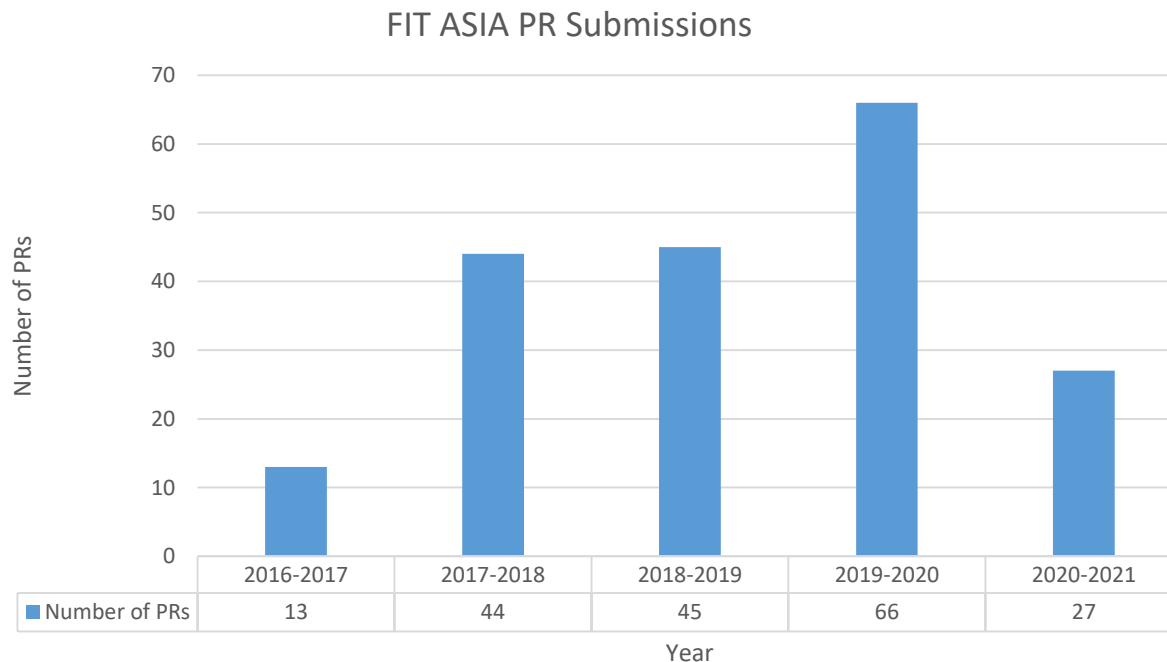
- **RAISED** - the PR has been filed by the originator but has not yet been processed by the CRA
- **ACTIVE** - CRA has processed the PR and allocated a PR # and someone to investigate it. During this phase the PR is under investigation
- **OPEN** - The CRA investigation is complete however some form of correction is required before it can be closed
- **OPEN- FIX AVAILABLE**- Corrective action has been implemented and fix is available for installation.
- **CLOSED AS DUPLICATE** - Closed because problem is already covered/tracked under another PR
- **CLOSED** – Corrective action has been implemented

PR Type Definitions

- **TBA-** To be assigned
- **AIR-** Avionics or flight crew issue
- **AIR- Procedural:** Flight crew issue
- **AIR- Technical:** Avionics issue
- **GROUND:** ATS unit system or controller issue
- **GROUND- Procedural:** ATS Controller issue
- **GROUND- Technical:** ATS unit system issue
- **NETWORK:** CSP or SATCOM service provider issue
- **MULTIPLE:** Multiple types of issues
- **NONE:** Report is non-problem

PRs filed by Asia Region

- Between August 2020 and August 2021 27 PRs have been filed for the Asia region.
- This is a noticeable decrease compared to the 66 PRs filed during the one year period leading up to FIT ASIA/10. However, this is not surprising due to the dramatic decrease in international air traffic due to Covid-19.



Significant Asia Region PRs

3099-KS Aircraft not meeting 95% RCP/RSP

Status: Open/Multiple

CAA Singapore submitted a list of aircraft which did not meet the 95% RCP/RSP requirements. The data provided for this PR included 702 instances where the delays were larger than 180seconds across many aircraft. Analysis of this data showed multiple reasons for the message delay.

The most common reason of the poor performance was due to media transitions when flying on the edge of VHF coverage. The CRA would like to emphasize the options for operators to reduce these types of transitions by optimizing their avionics configurations. This includes defining media region definitions to disallow VHF as well as implementing the RAT1 timer. Additional options are detailed in the FIT ASIA/9, WP3.

Additionally, a significant portion of the delayed data was found to be due to B777 aircraft. The B777 aircraft had a known issue which delayed downlinks. This has since been fixed and B777 operators are encouraged to update to AIMS V17B or later.

3113-MH B777 Performing Below 95% RCP/RSP

Status: CLOSED/MULTIPLE

CAA Singapore reported a B777 performing below 95% for RCP/RSP. Although there was not enough data points to come to a statistically significant conclusion for the cause of the poor performance, based on the available data, it was theorized that this was due to multiple reasons.

The first being that the aircraft flight path took it over a region with poor VHF coverage resulting in multiple transitions to and from SATCOM. Additionally, the B777 was operating with older AIMS software which had a known issue with delayed messages which has since been fixed in AIMS-2, BPV 17C and later.

3114-KS Aircraft performance below 95% RSP over IGWI, BTH1, and XXP

Status: CLOSED/Multiple

CAA Singapore reported aircraft performance below 95% RSP over IGWI, BTH1 and XXP. In the data provided, 86 of the 223 total delayed reports had a total transit time of over 180seconds.

The most significant reason for this was found to be due to flying on the edge of VHF coverage in the South China Sea. For issues reported with other stations, there was not enough data points available to determine a statistically significant cause.

100 data points has been the minimum with which we have been able to see a trend with. However, in practice, the CRA has found that on the order of 300-350 data points is needed to determine the actual cause of an issue.

3131-GM B747 Unable to Logon to CPDLC

Status: CLOSED AS DUPLICATE/AIR-Technical

Nippon Cargo Airlines reported they were unable to establish connection with RPHI. The flight crew reported that the ATC LOGON page would not accept any of the data necessary for a successful logon.

This is a known issue with the NG FMC which is installed on B747-8 and B747-400 aircraft. A fix for this issue is being incorporated in the next software update which is currently in the test phase. It is expected to be available for operators 3Q 2022.

This PR was closed as a duplicate of 2892-KS which is the master PR tracking this issue.

3154-GM CPDLC Error Message Received

Status: CLOSED/GROUND-Technical

BOBASMA reported receiving an error downlink in response to an uplink. Analysis showed that the uplink included a CLIMB TO and MAINTAIN (UM20) element as well as a REPORT REACHING (UM175) element.

The Airbus 350 avionics software rejected the uplink with an error downlink. This is per design due to the UM175 inclusion in the uplink. This element is not supported by the A350 avionics as per the GOLD recommendations.

3158-MM Continuous Error Messages Received

Status: CLOSED/TBA

BOBASMA reported receiving continuous error messages for a particular aircraft.

Data analysis showed that this error on the ground system was most likely due to multiple failed ADS-C and CPDLC uplinks to the aircraft. The cause of the failed messages was due to the airplane crossing the Bay of Bengal westbound but not switching from VHF to SATCOM as it exited VHF coverage from the Andaman Islands.

Boeing attempted to investigate further as to why the transition did not happen, however the aircraft operator did not provide the requested avionics logs. This PR was closed but a new PR will be opened if this issue is reported again.

3169-SH No CPDLC Replies From B747

Status: ACTIVE/AIR-TECHNICAL

AirNav Indonesia reported that no replies were received from a B747.

Data analysis showed that the avionics had trouble maintaining a SATCOM link over Iridium for a period of about 15 minutes. During this time, the avionics could not acknowledge uplinks, and the network delivered NO ACK messages to WAAF indicating that uplinks could not be delivered.

The cause of this SATCOM link problem cannot be determined, but the problem seemed to correct itself later in flight. The operator was contacted to ask if this aircraft has experienced further SATCOM difficulties. The more recent performance data for this tail in other regions looks nominal.

3178-MM Aircraft Not Meeting 95% RSP over SATCOM

Status: CLOSED/MULTIPLE

CAA Singapore reported less than 95% RSP performance over IGW1 and XXA.

Analysis of data indicates that the common cause for the cases of poor performance was not actually poor SATCOM (XXA and IGW1) performance, but rather poor VHF performance due to limited VHF coverage over the South China Sea.

Avionics prefer VHF over SATCOM, so if the avionics attempt but fail to successfully send a downlink via VHF (when exiting VHF coverage or operating along the edge of VHF coverage) and accordingly revert to sending it via SATCOM, then the time necessary to attempt VHF and subsequently revert to SATCOM causes SATCOM performance to appear poor when it actually is not.

The CRA would like to remind participants of FIT ASIA/9, WP03 which outlines methods to improve performance. Particularly, the CRA would like to emphasize the ACARS avionics "RAT1" timer that is intended to improve FANS performance during VHF-to-SATCOM transitions and is available in many avionics already. Additionally, the CRA noted that the data which CAA Singapore provided contains at least two pairs of duplicate downlink messages that should have been excluded from PBCS analysis per ICAO Doc 9869 (PBCS Manual) Second Edition.

Notable PRs Reported Outside Asia

3084-MH MAS-fail Received, No Re-attempt

Status: OPEN/GROUND-TECHNICAL

A CPDLC transfer from CZQX to EGGX failed because the End Service uplink from CZQX failed, due to a known problem; “aircraft unreachable while switching between Inmarsat Classic Aero GESs.”

The CSP delivered a MAS-fail; however Gander did not re-attempt the uplink. Gander is planning an update to their ground system to repeat failed uplinks. The CRA would like to remind participants that they should repeat uplinks if a MAS-fail is received.

3107-KS Multiple Copies of Uplink Received

Status: CLOSED AS DUPLICATE/MULTIPLE

The avionics received the same UM123 SQUAWK message multiple times as the result of multi-path uplink delivery when the aircraft had a weak VHF connection.

Two uplink attempts over VHF were successful, even though the avionics could not technically acknowledge them, as well as a SATCOM attempt. Some avionics (such as the Pegasus FMC on the B757 for this PR) does not identify duplicate messages when the same uplink is received over different media, and the crew responded WILCO several times.

3119-MM ERRONEOUS DOWNLINKS FROM B747 & B787

Status: OPEN/AIR-TECHNICAL

The FAA received several erroneous downlinks from the 787 and 747-8 aircraft. Upon investigation, Boeing and Honeywell determined that the 747-8 and 787 avionics sent invalid (truncated) CPDLC position reports (dm48).

This was found to be due to the software not properly converting the wind direction to a value of 1 to 360 integer degrees (which the CPDLC syntax defines), when the actual wind direction was between 0.0 and 0.9 degrees. Boeing and Honeywell will fix this problem in the next 787 CMF and 747-8 FMC software releases.

2459-MM Invalid ADS-C Downlinks

Status: CLOSED/AIR-Technical

Fukuoka (and later Oakland Oceanic) reported receiving an invalid ADS-C timestamp of 3,600 seconds in the basic group from a B787.

This problem was due to a 787 ADS-C application software fault that caused it to incorrectly round the ADS-C timestamp to 3,600 seconds (instead of back to 0 seconds) when the current time is between 3,599.938 seconds and 3,599.999 seconds after the current hour.

Boeing and Honeywell fixed this problem in 787 CMF BPV6 software, which became available in September 2019 on new airplanes delivered from Boeing and became available in December 2019 for retrofit via a Service Bulletin.

Less significant Asia region PRs

- There were 19 less significant Asia region PRs
- Please refer to the associated working paper for more details regarding these PRs

Other Issues Seen

Other issues seen

- Operators who do not authorize release of logs and are not part of PBCS charter.
 - This results in inability to obtain logs before they expire. In certain cases we have requested ARINC/SITA pull the logs and hold them until authorization can be obtained. However, further queries to the airline for authorization remained unanswered.
- PBCS performance PRs
 - In many cases, there are not enough data points to determine cause of issue
 - 100 data points per aircraft is the minimum count required to do the data analysis
 - However, in practice, it takes ~300-350 data points to really determine cause
 - When a PR is filed without enough data points for analysis, the CRA will open a Master PR for tracking. Then subsequent PRs for the same operator/aircraft will be added to that dataset to see if any trends can be determined.

Interoperability Testing

- Offered through the Boeing Company (outside of CRA responsibilities).
- Testing has been done with multiple ATC centers within and outside of Asia.
- Interoperability testing with ATC Centers 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 center
- Contact: rochelle.e.perera@boeing.com for questions about interoperability testing or to schedule a session

Backup- CRA Website Information

CRA Website Information

All ATS datalink stakeholders should sign up for the FANS CRA website.

- 1) Access www.fans-cra.com
- 2) Select Sign Up on the upper right



FANS1/A Problem Reporting

- 3) Fill out form and select Sign Up on the bottom left

Additional Emails (separate by *semicolon* or *space*):



PBCS Charter sign up

All PBCS stakeholders are encouraged to sign the charter.


- 1) Access www.fans-cra.com and sign in
- 2) Select PBCS Charter from the top banner
- 3) Under “PBCS Charter” tab, read each section of the charter (a pdf can be downloaded via the “download pdf” button on the top right of the tab)

De-identified Reports Performance Data and Administration **PBCS Charter** Contact Us Manual

PBCS CHARTER CHARTER STAKEHOLDERS YOUR CHARTER STATUS

Performance-Based Communication and Surveillance (PBCS) Global Charter

Charter Document Version June 8, 2018

 **DOWNLOAD PDF**

1 Charter Purpose and Applicability

PBCS Charter sign up

All PBCS stakeholders are encouraged to sign the charter.

4) Select “your charter status” tab

5) Fill out form, and select the checkbox on the top right. Then select “update” on the bottom right.

The screenshot shows a web interface for signing up for the PBCS Charter. At the top, there are three tabs: "PBCS CHARTER", "CHARTER STAKEHOLDERS", and "YOUR CHARTER STATUS". The "YOUR CHARTER STATUS" tab is highlighted with a red circle. Below the tabs, the form is titled "PBCS Charter - Point of Contact". It has two input fields: "Name:" and "Email:". To the right of the form, there is a checkbox labeled "Boeing", which is also circled in red. Below the form, there are two paragraphs of text: "To indicate acceptance of charter and add your organisation to the list of charter stakeholders select the tick box above and then select update." and "To remove yourself from the list of charter stakeholders deselect the tick box and then select update." At the bottom right, there is a blue "UPDATE" button, which is circled in red.

PBCS CHARTER CHARTER STAKEHOLDERS **YOUR CHARTER STATUS**

PBCS Charter - Point of Contact

Name: _____

Email: _____

Boeing

To indicate acceptance of charter and add your organisation to the list of charter stakeholders select the tick box above and then select update.

To remove yourself from the list of charter stakeholders deselect the tick box and then select update.

UPDATE

Questions?

