Twenty-Ninth Meeting of the FANS Interoperability Team (FIT/29)

Virtual

10-11 August 2022

Future Air Navigation System (FANS) Problem Report (PR) Briefing

Presented by the Central Reporting Agency (CRA)

SUMMARY

This paper describes recent investigation and disposition of submitted FANS PRs that are relevant to the FIT.

1 INTRODUCTION

1.1 FANS stakeholders may submit PRs for investigation via the http://www.fans-cra.com/ website.

a) Airways Corporation of New Zealand (ACNZ) graciously hosts and maintains this website.

b) Stakeholders from multiple regions use this website, including the South Pacific region (ISPACG FIT), the North and Central Pacific region (IPACG FIT), the Asia region (FIT-Asia), and the North Atlantic region (NAT TIG).

1.2 Between preparation of the previous FANS PR briefing for the FIT/28 meeting held in August 2021 and preparation of this FANS PR briefing, FANS stakeholders submitted 229 PRs via the website, of which 19 PRs (8%) occurred in the South Pacific region. For comparison, the previous FANS PR briefing indicated that FANS stakeholders submitted 112 PRs, of which 19 PRs (17%) occurred in the South Pacific region.

1.3 Figure 1 illustrates the number of PRs submitted per calendar year starting in 2006. The total number of PRs for 2022 is a linear projection based on the number of PRs submitted to date.

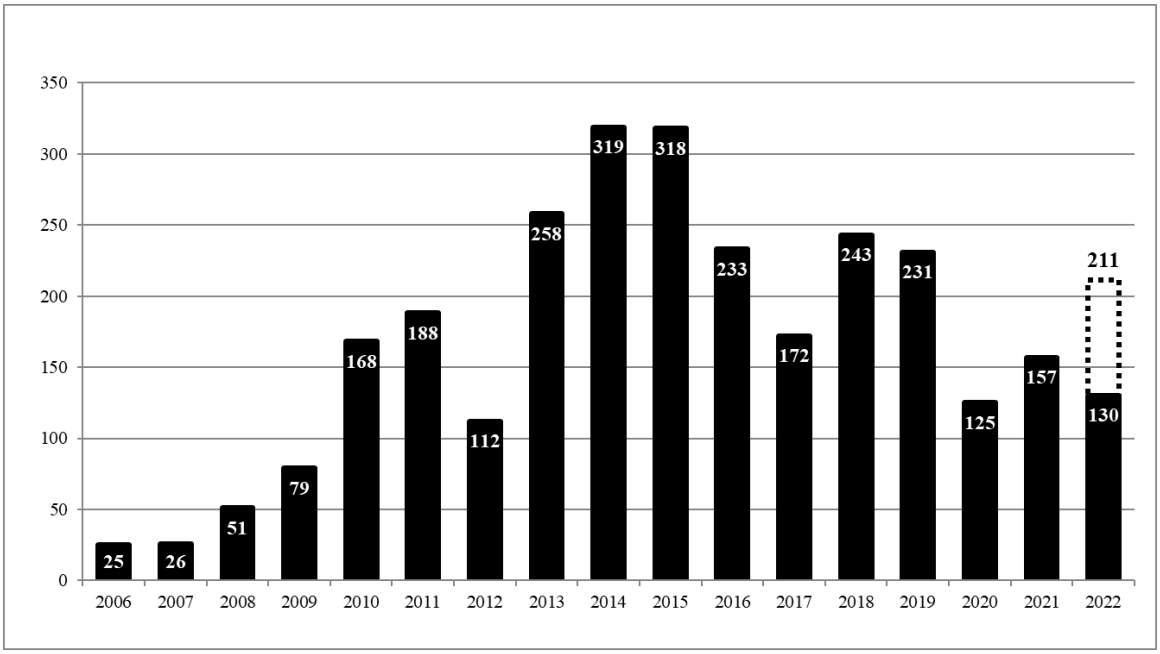

Figure 1 FANS PRs Per Year

1.4 PR status definitions include the following:

- **Raised:** The originator submitted the PR.
- **Active:** The CRA processed and assigned the PR for investigation.
- **Open:** The CRA completed the PR investigation but some form of corrective action is required.
- **Open – Fix Available:** The appropriate stakeholder implemented corrective action and a fix is available for installation.
- **Closed:** The CRA closed the PR because the appropriate stakeholder implemented corrective action.
- **Closed As Duplicate:** The CRA closed the PR because the CRA is tracking the problem under another PR.
- **Closed – Monitoring:** The CRA closed the PR because no corrective action can be determined, but the CRA will monitor future PRs for any recurrences.

1.5 PR type definitions include the following:

- **TBA**: To be assigned
- **Air – Procedural**: Flight crew issue
- **Air – Technical**: Avionics issue
- **Ground – Procedural**: Air traffic controller issue
- **Ground – Technical**: ATS unit system issue
- **Network**: Communication service provider or SATCOM service provider issue

- **Multiple**: Multiple types of issues
- **None**: Report is a non-problem

2 DISCUSSION

2.1 The CRA notes updates to the following old PRs which are relevant to the ISPACG FIT:

a) 747-400 and 747-8 NG FMC Block Point 4.1 software, which Boeing and Honeywell currently plan to make available in the first quarter of 2023, will resolve the following PRs:

i. 2892-KS, Open / Air – Technical. This is the master PR for known Boeing 747-8 AFN logon problems, including the inability of the flight crew to enter the origin and destination airport designators on the ATC LOGON/STATUS page. Boeing has published a workaround procedure for this problem in Flight Operations Technical Bulletin 747 21-77.

ii. 3119-MM, Open / Air – Technical. The FAA reported that it received invalid CPDLC position reports from a Korean Airlines Boeing 747-8. Boeing and Honeywell determined that the avionics sent the invalid reports because when the wind direction was between 0.0 and 0.9 decimal degrees the avionics failed to properly convert the wind direction to the range from 1 to 360 integer degrees that the CPDLC syntax defines.

iii. 3251-GM, Open / Air – Technical. A Nippon Cargo Airlines 748-8 flight crew reported that the speed value contained in a CPDLC uplink differed by 0.01 Mach between display on the ATC UPLINK page and display on the ATC LOG page.

b) 3171-MM, Closed / Network. Airways New Zealand, Airservices Australia, and the FAA reported a loss of communications on 14 April 2021 with airplanes using SATCOM via SITA while they continued normal operations with airplanes using SATCOM via ARINC. SITA indicated that the problem affected internetworking (an aircraft connected to one CSP and an ATS provider connected to another CSP) for almost three hours and that it completed two actions to prevent the problem from recurring.

c) 3189-SH, Open / Ground – Technical. A Delta Air Lines Airbus A350 flight crew reported that several route clearances from Oakland Oceanic resulted in PARTIAL LOAD indications. Airbus determined that the indications occurred because the route clearances contained waypoints that have duplicate identifiers in the aircraft's navigation database, but the route clearances did not include the optional latitude and longitude coordinates for those waypoints that would have allowed the avionics to choose the intended waypoint. Airbus referenced NAT TIG/10 WP/05 (submitted as a FIT/29 IP), in which it recommended that ATS providers always include the optional latitude and longitude coordinates and also noted that including the latitude and longitude coordinates are mandatory for Baseline 2 CPDLC. The FAA indicated that it is considering including the optional latitude and longitude coordinates in a future ground system software release.

d) 3195-MM, Closed / Network. Airways New Zealand and the FAA reported excessive delays to ADS-C reports from multiple aircraft using Iridium SATCOM via SITA on 13 June 2021. SITA indicated that the delays occurred due faulty hardware that was

subsequently replaced and that it would review its real-time monitoring of performance degradations.

2.2 The CRA received the following significant new PRs which occurred in the South Pacific region:

a) 3284-MM, Active / Multiple. An Air New Zealand Boeing 787 flight crew reported that a CPDLC transfer of authority from Port Moresby to Brisbane failed. The CRA assigned this PR to SITA to investigate why it did not attempt to deliver the END SERVICE uplink from Port Moresby to the aircraft and also to PNG Air Services to consider resending failed FANS uplinks once per ICAO Doc 4444 (PANS-ATM) Section 14.3.8 guidance.

b) 3290-MM, Closed / Ground – Technical. An Air New Zealand Boeing 787 flight crew reported that they received a CHECK FMS AND CORRECT ACTIVE WAYPOINT uplink from Oakland Oceanic while operating in accordance with the cleared route. The FAA indicated that the controller evidently sent the uplink due to a ground system error message regarding JAQIN as the next-plus-one waypoint in the most recent ADS-C waypoint change event report from the aircraft, in turn because JAQIN was not adapted in the system. The FAA adapted JAQIN in its system on 30 December 2021.

c) 3346-MM, Active / TBA. Airservices Australia reported that Brisbane received a WILCO downlink from a Delta Air Lines Airbus A350 that did not include a message reference number (MRN). The CRA assigned this PR to Airbus to investigate. Please refer to the Airbus PR briefing for details regarding this PR.

d) 3378-MM, Active / TBA. Airways New Zealand reported that it received ADS-C reports from a general aviation Bombardier Global Express that contained both invalid and incorrect data. The CRA assigned this PR to Bombardier to investigate.

e) 3388-MM, Active / TBA. An Air New Zealand Boeing 787 flight crew reported that CPDLC transfers of authority from Oakland (domestic) to Oakland Oceanic and from Oakland Oceanic to Tahiti failed and that multiple AFN logon attempts were required to subsequently establish CPDLC connections.

   i. Regarding the problems from Oakland to Oakland Oceanic, the CRA found that they evidently occurred because the aircraft was exiting VHF coverage (entering oceanic airspace) but SITA was slow or did not attempt to send uplinks via SATCOM. The CRA assigned this PR to SITA to investigate.

   ii. Regarding the problems from Oakland Oceanic to Tahiti, the CRA found that Oakland Oceanic designated Tahiti as the NDA but did not actually send an END SERVICE uplink to terminate its CPDLC connection with the aircraft. Oakland Oceanic indicated that it did not send an END SERVICE uplink because there were two open CPDLC uplinks from a previous CPDLC connection with the aircraft and that it would write up an issue against its ground system for an automatic END SERVICE uplink being inhibited when there are open CPDLC uplinks.

f) 3404-MM, Closed as Duplicate / Air – Technical. Airservices Australia reported that it received a concatenated dM62 ERROR and dM67 THIS CONCATENATION NOT SUPPORTED BY THIS AIRCRAFT free-text downlink from a general aviation Bombardier Global 7500 in response to a concatenated uM169 IDENTIFICATION

TERMINATED free-text and uM117 MONITOR uplink. Bombardier indicated that the avionics incorrectly applied the ATN CPDLC restriction that uM117 CONTACT can be concatenated with only uM135 CONFIRM ASSIGNED LEVEL or uM183 free-text to FANS CPDLC and that it and Collins will correct this problem in the next avionics software version. The CRA closed this PR as a duplicate of PR 3231-MM, which remains Open to track this problem.

g) 3405-MM, Active / TBA. An Air New Zealand Airbus A320 flight crew reported that the avionics displayed a LOAD FAILED message when they attempted to load a CPDLC route clearance. The CRA assigned this PR to Airbus to investigate. Please refer to the Airbus PR briefing for details regarding this PR.

h) 3409-MM, Closed / Network. Airways New Zealand reported that at about 20:00 UTC on 2 June 2022 ARINC started to deliver uplinks via HFDL to numerous aircraft that were using SITA as their CSP for VHF and SATCOM with corresponding performance degradations to below the 95% normal operating requirement for CPDLC transaction time. ARINC indicated that this problem occurred due to two issues related to migrating its FANS gateway to new servers, specifically a network interface card that was not fully seated and code that was interpreted differently on the new servers and resulted in delivery of uplinks via HFDL when VHF and/or SATCOM were available through SITA. The CRA closed this PR based on corrective actions taken by ARINC, including actions to prevent the issues from recurring. The CRA also notes that Nav Canada reported the same problem as PR 3395-MM, which is now closed as a duplicate of this PR.

i) 3415-MM, Active / TBA. Satcom Direct reported that a general aviation Bombardier Global Express sent a large number of ADS-C reports to Melbourne shortly before landing at Sydney. The CRA assigned this PR to Bombardier to investigate and notes that it is similar to PR 3332-MM involving a Bombardier Challenger 650.

2.3 The CRA received the following significant new PRs which occurred outside the South Pacific region but which are relevant to the ISPACG FIT:

a) 3223-MM, Closed / Network. The FAA reported uplink failures and excessive delays to ADS-C reports via Iridium SATCOM during certain periods on five days in July 2021. Iridium found that Virtual Private Network (VPN) changes required for firewall updates caused the delays.

b) 3230-MM, Active / TBA. The FAA reported that it received many ADS-C waypoint change event reports from Airbus A350 aircraft that contained nearly identical current and next waypoint positions. The CRA assigned this PR to Airbus to investigate.

2.4 The CRA received the following less-significant new PRs which occurred in the South Pacific region:

a) 3205-KS, Closed / Air – Technical. Airways New Zealand reported that an Air New Zealand Airbus A321 unexpectedly rejected a CPDLC uplink because the avionics apparently determined that the uplink exceeded the maximum uplink delay. As Airbus indicated in their FIT/28 PR briefing, this problem occurred because the avionics incorrectly determined that the uplink was delayed by more than 24 hours when it was sent shortly before 00:00:00 UTC and received shortly after 00:00:00 UTC. Airbus also

indicated that A320 ATSU CSB7.5 software and A330 ATSU CLR7.5 software fix this problem.

b) 3224-MM, Active / TBA. Airports Fiji Limited reported that an ADS-C cancel-all-contracts-and-terminate-connection request failed to be delivered to a Qantas Airbus A330. The CRA assigned this PR to Airbus to investigate. Please refer to the Airbus PR briefing for details regarding this PR.

c) 3250-MM, Closed / Air – Procedural. Airservices Australia reported that it received 37 AFN logons from a general aviation Dassault Falcon 2000 during a 2.5 hour period with each logon containing a position in the eastern United States. The CRA advised the aircraft operator and its maintenance provider via the operator's flight support services provider (ARINCDirect) to refrain from sending AFN logons without an operational reason.

d) 3265-MM, Closed / Network. Airways New Zealand reported that communications were lost between Nadi and an Air New Zealand Boeing 787. Airways New Zealand further reported that the problem occurred due to a local telecom service provider fault.

e) 3271-MM, Active / TBA. The FAA reported that it received CPDLC error downlinks in response to CPDLC route clearance uplinks which it sent to a Fiji Airways Airbus A330. The CRA assigned this PR to Airbus to investigate. Please refer to the Airbus PR briefing for details regarding this PR.

f) 3279-MM, Active / TBA. A Royal Australian Air Force Dassault Falcon 7X flight crew reported that the avionics established CPDLC connections with Ujung Pandang and Brisbane but did not provide the expected ATC COMM ESTABLISHED indications. The CRA assigned this PR to Honeywell to investigate.

g) 3314-MM, Closed / Air – Procedural. An Air New Zealand Boeing 787 flight crew reported that a Brisbane controller queried them regarding operating on a weather deviation following receipt of a BACK ON ROUTE report from the aircraft. The flight crew responded that they were still operating on the weather deviation and did not send the BACK ON ROUTE report, although analysis of the avionics diagnostic data indicated that the flight crew did in fact send the report.

h) 3337-KS, Active / TBA. Airservices Australia reported that a Malaysia Airlines Airbus A330 unexpectedly rejected a CPDLC uplink because the avionics apparently determined that the uplink exceeded the maximum uplink delay. The CRA assigned this PR to Airbus to investigate. Please refer to the Airbus PR briefing for details regarding this PR.

i) 3348-GM, Active / TBA. Airways New Zealand reported that a CPDLC climb clearance failed to be delivered to an Air New Zealand Boeing 777. Boeing determined that this problem was not a recurrence of the "ack-and-toss" issue that was fixed in 777 AIMS-2 Block Point Version 17.1 software and is investigating possible SATCOM issues with SITA.

j) 3412-MM, Closed / Air – Procedural. Air Tahiti Nui reported that a Boeing 787 flight crew was delayed in performing an AFN logon to Oakland Oceanic due to the appearance of a flight deck alert related to cargo hold temperature. After addressing the alert and establishing communications via HF voice with Oakland Oceanic, the flight crew

performed an AFN logon to Oakland Oceanic and Oakland Oceanic established a CPDLC connection with the aircraft.

3 ACTION BY THE MEETING

3.1 The CRA invites the ISPACG FIT to:

a) note the content of this paper; and

b) promote expeditious resolution of Active and Open PRs.