FANS Interoperability Team Meeting (FIT/21)

Papeete, Tahiti
4-5 March 2014

Agenda Item 5 Working Papers

Performance Based Communications and Surveillance (PBCS)

Presented by Airways New Zealand

SUMMARY

Two FANS1/A performance issues identified in NZZO in 2013 provide good examples of why we support performance based communications and surveillance. The first issue involved the introduction of a new aircraft fleet where measured performance was well below that observed on other fleets of the same type and below RSP180 requirements. The second issue involved a significant deterioration of measured performance for all aircraft using the Pacific I4 GES.

1. INTRODUCTION

1.1.1 At Airways we aim is to monitor FANS1/A RCP and RSP performance on a monthly basis in accordance with guidance in Appendix D of the Global Operational Data Link Document (GOLD). Effective performance monitoring is required: to ensure that new operators are meeting the expected performance standards before the application of reduced separations is approved; and that for existing operators observed performance continues to meet the standards required.

1.1.2 In 2013 a software issue at the Pacific I4 GES caused all aircraft using the Pacific I4 to be operating below the RSP180 standard between 12th August and 20th November. In 2013 a new A330 fleet was introduced into service in the Pacific which commenced FANS1/A operations demonstrating performance well below the RSP180 standard.

2. DISCUSSION

Inmarsat I4 Performance 12 August – 20 November 2013

2.1 In September 2013 analysis of the August performance figures detected an apparent deterioration in performance of aircraft using the I4 satellite. In September 2013 Air New Zealand requested monitoring of the performance of their B77W fleet as they transitioned the aircraft to the Inmarsat I4. Analysis of the September and October data for these aircraft showed a significant deterioration below that expected and further investigation showed that all I4 traffic was being affected. Analysis of all fleets operating on the I4 showed consistent performance deterioration as indicated in the table below.

Fleet	RSP180 180 seconds
UAE A388 (XXA)	98.09%
QFA A388 (APK)	99.21%
SIA B77W (APK)	97.32%
ANZ B77W (APK)	98.46%

2.2 An analysis of data from the SIA B77W fleet 2011-2013 (refer Figure 1 below) clearly showed deterioration in performance in 2013. SIA had been one of the first fleets to transition to the I4 in NZZO airspace in 2012.

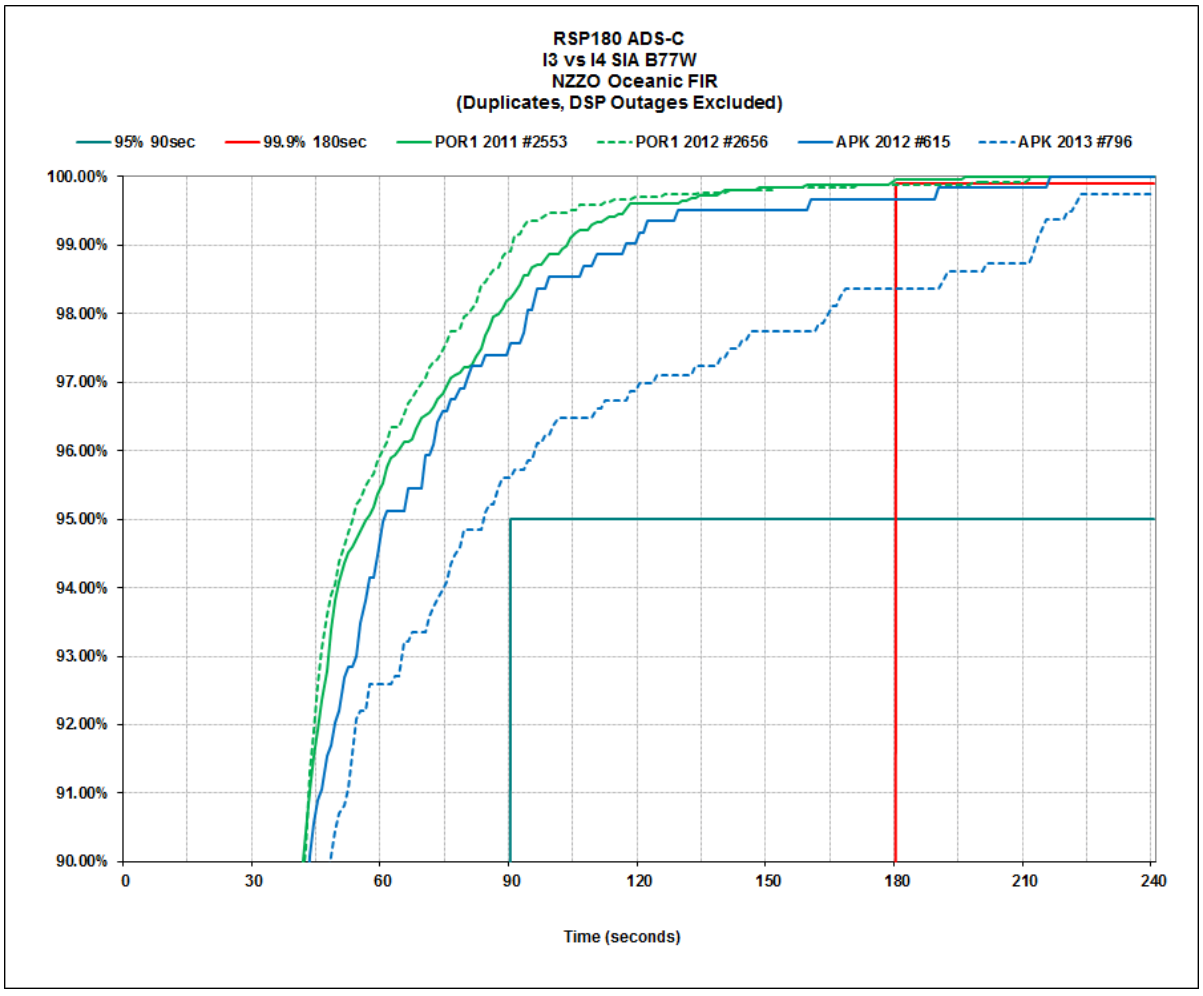

Figure 1: ANZ B77W I4 - September October 2013

2.3 A FANS problem report was raised on the CRA website on 25 November. Feedback to the PR was swift and Inmarsat advised that the observed deterioration had been caused by a software fault in a software package released into operation on 12th August that was causing all AES operating on the Pacific I4 to be allocated to a low speed 1200bps channel. Inmarsat also advised that the fault had been rectified on 20 November which was confirmed by subsequent analysis.

Introduction of a new fleet into service

2.4 In early 2013 a new A332 fleet was introduced into the SOPAC. Monitoring of RSP180 and RSP240 performance from this fleet which had been incentivized by numerous controller complaints of sub-standard performance confirmed controller assessments. The observed performance is depicted in Figure 2 which illustrates typical performance from another A332 fleet (C4B) and the below par performance from the new fleet (B4B). The degraded performance falls below the normal operating 95% 90 second performance level. We have observed in the past that controller complaints of poor performance will be heard when performance falls below the 95% 90 second level and this occurred in this example.

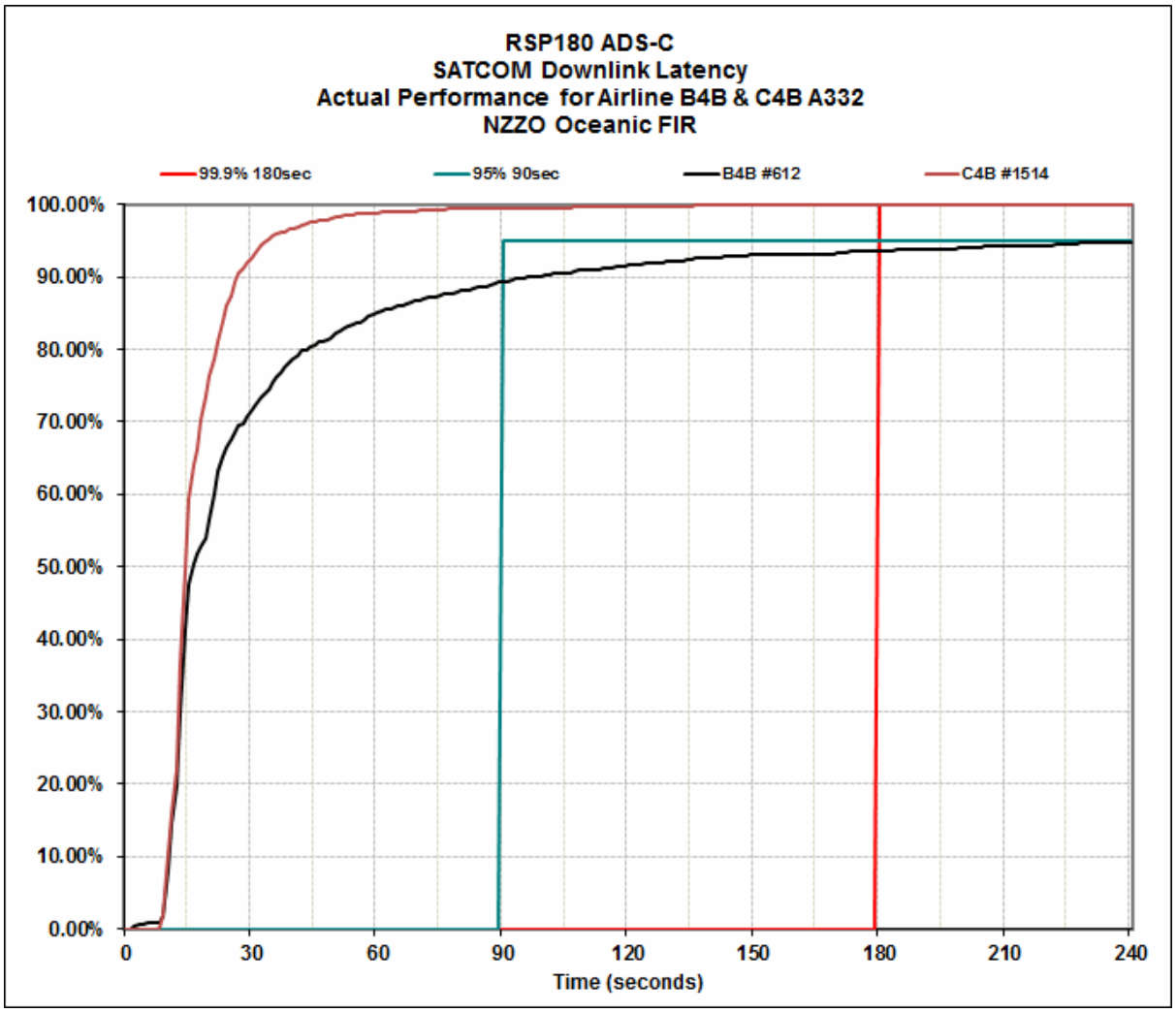

Figure 2: New fleet operating below RSP180 standard

2.5 Airbus investigation determined that the aircraft had been set-up to use HFDL in the Airbus next-on-busy mode. Unfortunately, the airline was not an ARINC customer and any messages downlinked by HFDL were promptly discarded. Additionally, the airline had not registered to use the Inmarsat I4 service so the aircraft AES was being rejected from the I4 back to the I3. We had seen similar I4 registration problems on an A388 implementation and the performance impact is quite significant.

2.6 This issue generated three CRA problem reports. Two from Air Services and one from ourselves. The performance issues are now resolved with HFDL de-activated and the aircraft operating on the Inmarsat I3.

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2.7 The issue discussed above illustrate that new aircraft will not necessarily meet the required RSP180/RCP240 standards for reduced separation standards and that all new aircraft should be assessed for compliance before these separation standards are introduced.

2.8 As we often hear in investment circles past performance is not an indication of future results. In the FANS1/A data link world the same axiom applies and ICAO Annex 11 has a clear requirement on all ANSP that requires data link system performance monitoring to varify that an acceptable level of safety continues to be met. Annex 11 at paragraph 2.2.7.5 states:

"Any significant safety-related change to the ATC system, including the implementation of a reduced separation minimum or a new procedure, shall only be effected after a safety assessment has demonstrated that an acceptable level of safety will be met and users have been consulted. When appropriate, the responsible authority shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met."

2.9 Since the introduction of FANS1/A we have observed a number of instances in addition to those discussed above where system changes have resulted in significant performance deterioration. The comment by one of the participants at a PBCS seminar in Bangkok in 2013 when he stated "***you do not know what you cannot see***" rings true.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) Note the further examples of FANS1/A data link performance deterioration detected in 2013; and

b) Discuss the implementation of PBCS in the SOPAC.