



International Civil Aviation Organization

**The 2<sup>nd</sup> Meeting of the Future Air Navigation Systems Interoperability Team-Asia (FIT-Asia/2)**

Bangkok, Thailand, 28 – 29 March 2013

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**Agenda Item 3: Review of ADS/CPDLC Operations**

**FANS1/A Performance in NZZO**

(Presented by Airways New Zealand)

**SUMMARY**

This paper presents the observed performance of FANS1/A data link in the NZZO oceanic FIR, and comments on the current monitoring and improvement processes used by the Informal South Pacific Coordinating Group (ISPACG).

This paper relates to –

**Strategic Objectives:**

A: *Safety* – Enhance global civil aviation safety

**Global Plan Initiatives:**

GPI-17 Data link applications

GPI-22 Communication infrastructure

**1. INTRODUCTION**

1.1 Data obtained from post implementation monitoring of CPDLC and ADS-C in the Auckland Oceanic FIR (NZZO) is used to measure FANS1/A system performance against Required Communications Performance (RCP) and Required Surveillance Performance (RSP) using guidance from the Global Operational Data Link Document (GOLD).

1.2 CPDLC and ADS-C performance against the RCP240 and RSP180 standards has been steady through 2012 but has shown improvement in some areas as problems that are identified by post implementation monitoring, are fixed using the regional Central Reporting Agency (CRA) process, and the fixes are rolled out to the fleets.

**2. DISCUSSION**

ADS-C Performance

2.1 The observed performance of ADS-C downlinks in 2012 shows little change from 2011. The RSP180 requirement is for 99.9% of downlinks to be received within 180 seconds, and for 95% of downlinks to be received within 90 seconds. We observed 99.7% within 180 seconds and 99.12% within 90 seconds in 2012. All of the 26 fleets monitored meet the 95% 90 seconds normal operations requirement. 11 fleets meet the 99.9% 180 second requirement, and a further 5 were above 99.5%. ADS-C performance data in tabular and graphical form is appended to this paper at **Attachment 1**.

### CPDLC Performance

2.2 For RCP240 Required Communications Technical Performance (RCTP) the requirement is for 99.9% of transactions to be completed within 150 seconds and 95% to be completed within 120 seconds. Acceptable performance was observed in 2012 with little change from that observed in 2011. Actual Communication Technical Performance data in graphical and tabular form is provided at Attachment 1.

2.3 For RCP240 Required Communications Performance (RCP) the requirement is for 99.9% of transactions to be completed within 210 seconds and 95% to be completed within 180 seconds. Nearly all fleets operating in NZZO are meeting the 95% normal operations requirements and for those not meeting the 99.9% requirements most are assessed as being acceptable for RCP240 operations. Actual Communication Performance data in graphical and tabular form is provided at Attachment 1.

2.4 The intervention message set used for RCP analysis was changed for the 2012 analysis and route and communications transfer transactions were removed from the message set used for data analysis because they are not typical of intervention messages used when applying reduced separations. The revised data set used in the NZZO 2012 analysis of RCP has been incorporated in the draft GOLD Edition 2.

### Availability

2.5 Inmarsat. An unreported outage at a CSP in 3rd quarter 2012 of 220 minutes (UPS maintenance) and another CSP outage in early February 2013 of 48 minutes degraded measured availability in 2012. There were no reported issues with RGS stability during 2012. The upgrade of the I3 satellite RGS to I4 standard that commenced 26 February at Perth is expected to enhance RGS reliability.

2.6 Iridium. We have little Iridium traffic in NZZO but the Iridium network does suffer from only having a single GES which is affected by weather outages. There have also been a number of technical outages during 2012. We understand that Iridium have included additional GES in their Iridium-Next architecture. Airways started monitoring Iridium availability in 2012 as we see more Iridium equipped aircraft in our area of interest.

2.7 We are currently struggling with the clarity of some of the Iridium reports. The use of the phrase “degraded performance” and whether any reported “degraded performance” actually affects FANS1/A latency means we are not sure if an outage is occurred or not. NZZO does not see enough Iridium traffic to review actual latency during reported weather outages at the Tempe GES. Comments from a North Atlantic ATSP that observes more Iridium traffic indicates that latency may not be dramatically affected. However, currently we record any reported degraded performance as an outage. This is why Iridium availability as shown in Attachment 1 falls well short of RCP240 requirements.

### Post Implementation Monitoring

2.8 ICAO mandates post implementation monitoring to ensure that when applying reduced separations that have specific communications and surveillance performance requirements that the required performance is met. Post implementation monitoring also drives continuous performance improvement by enabling the identification and resolution of performance issues. Post implementation monitoring of FANS1/A performance by individual ATSP and a central reporting agency (CRA) that has enabled a problem reporting system to investigate and resolve performance issues is essential in today’s data-link environment.

2.9 The ISPACG CRA has been operating since the late 1990’s using a problem reporting system to identify and resolve performance issues. A web-based on-line problem reporting service was made available in 2009.

2.10 Post-implementation monitoring by ISPACG ATSP is transitioning to the RCP/RSP based monitoring described in Appendix D of the GOLD. Performance monitoring in accordance with GOLD guidance has enabled the identification and resolution of a number of significant FANS1/A performance issues since 2009. For those individual aircraft or fleets that show performance significantly below the required RCP/RSP standard then we report the issue using the web-based problem reporting and the ISPACG Central Reporting agency (CRA) will initiate an investigation.

2.11 Graphical data is provided at Attachment 1 that illustrates observed FANS1/A performance improvement since 2009. We think this clearly demonstrates that post implementation monitoring does drive performance improvement. Additional performance data for NZZO is available on the ISPACG CRA website at <http://www.ispacg-cra.com/>.

### **3. ACTION BY THE MEETING**

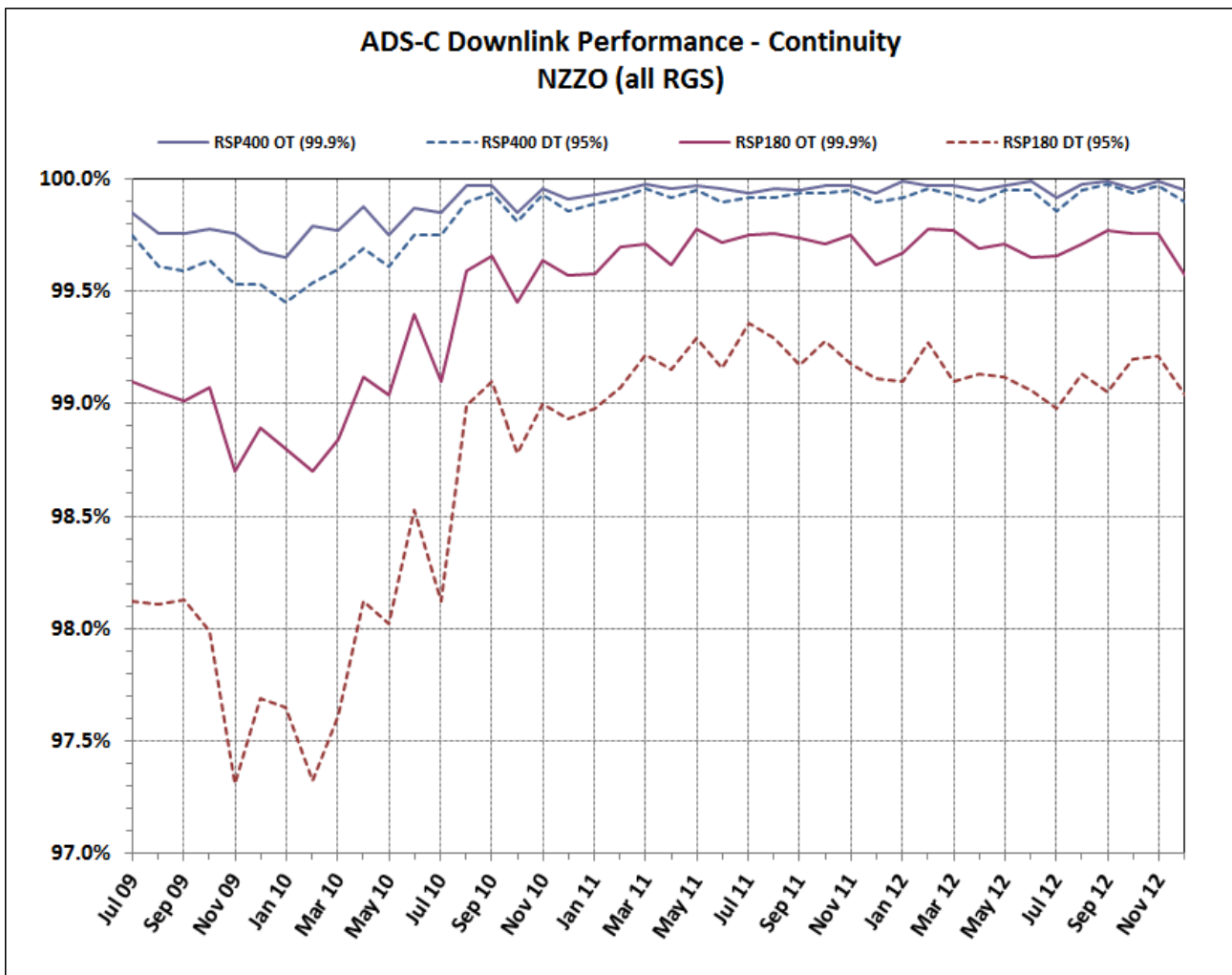
3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

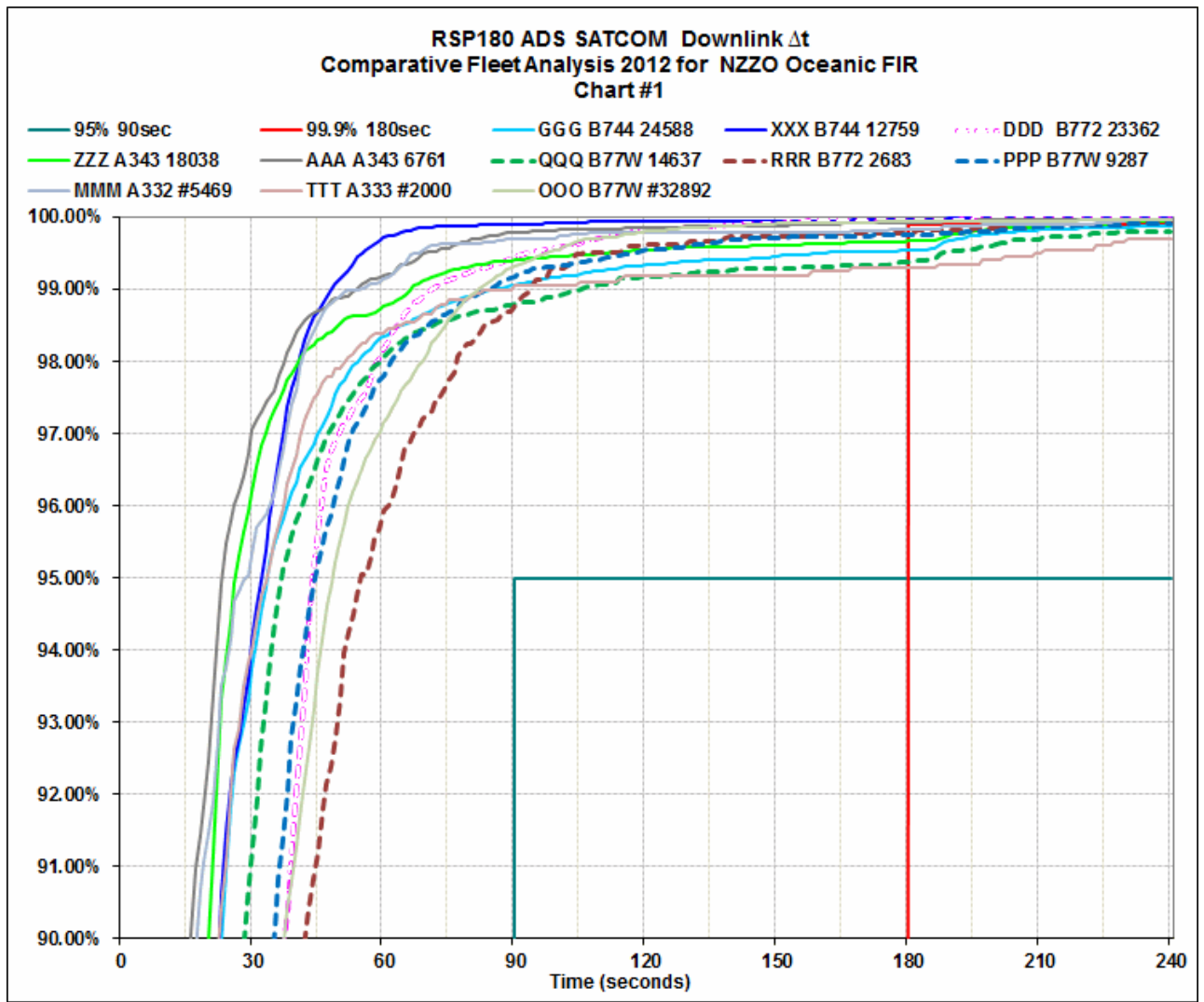
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WP05  
ATTACHMENT 1  
Attachment 1: Performance and Availability Data NZZO

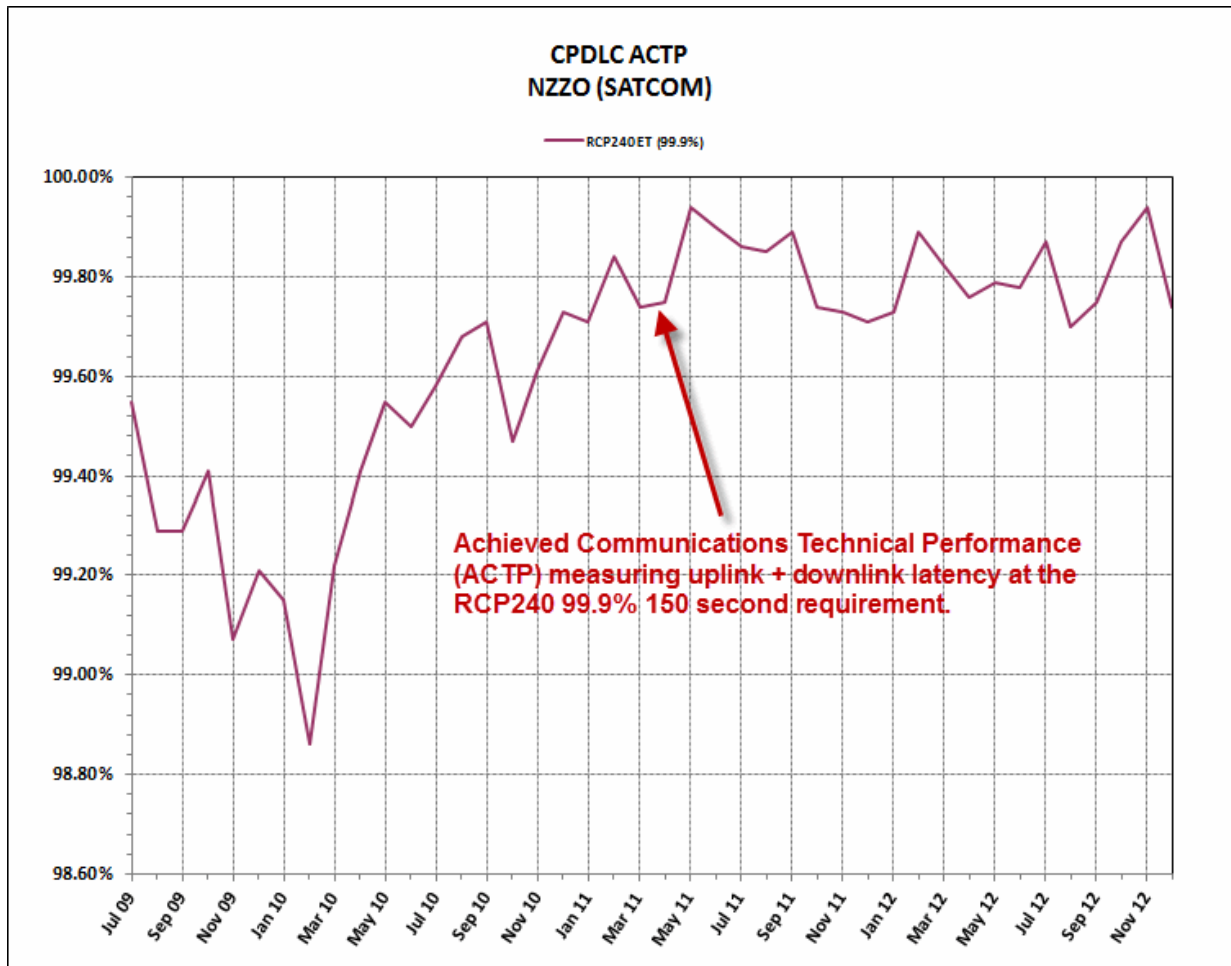
ADS-C Performance: 2009-2011



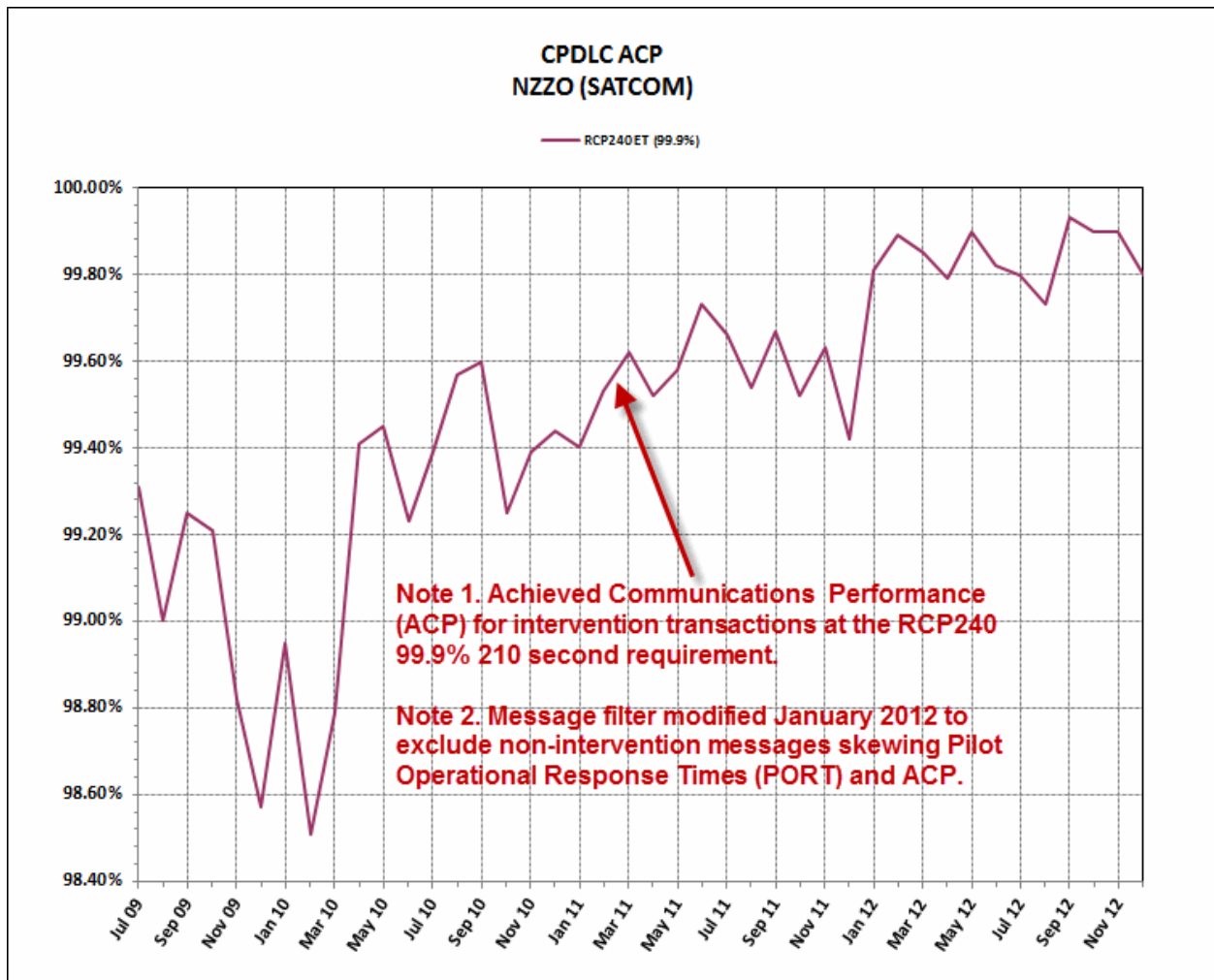
**ADS-C : Getting Better.**



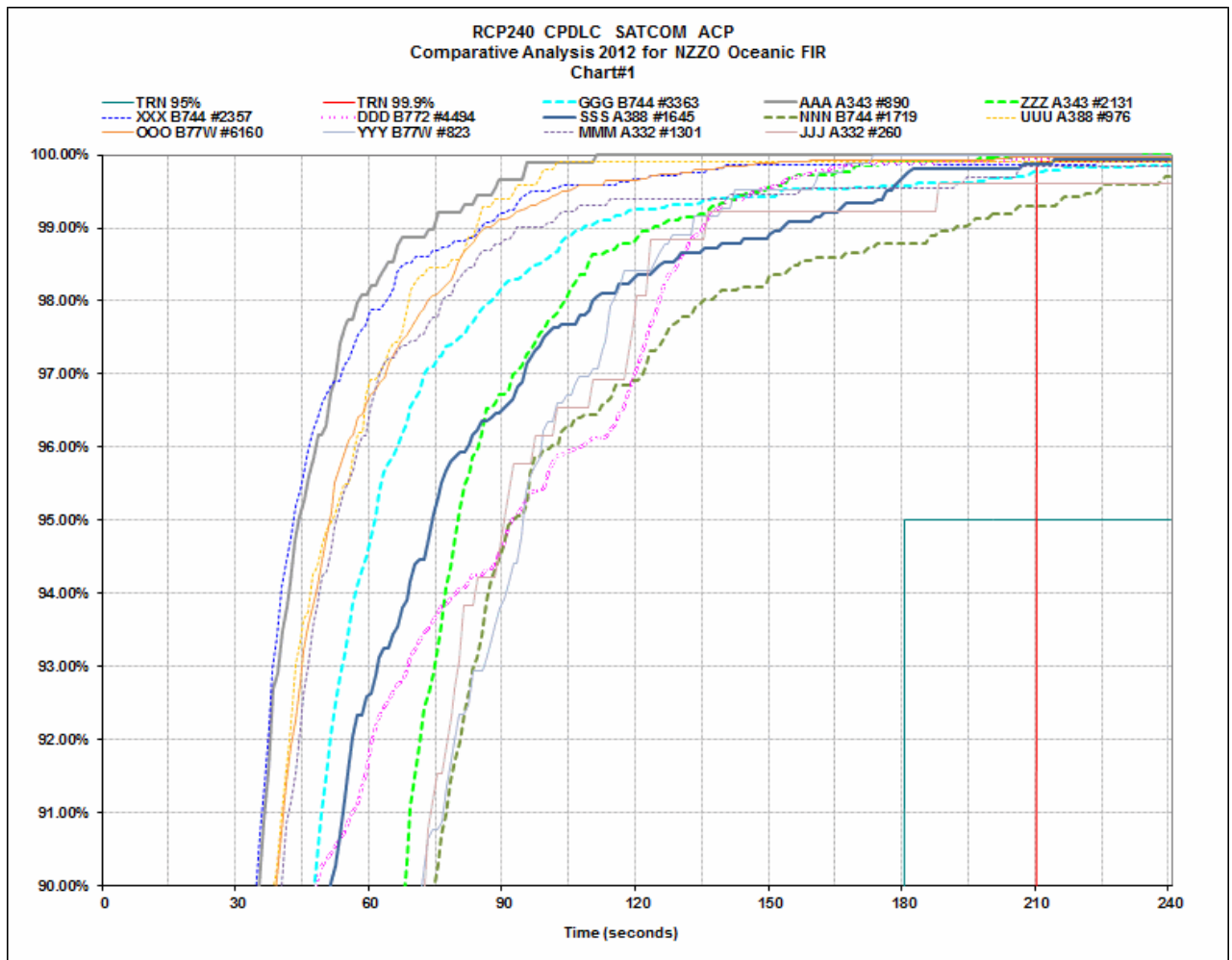
**CPDLC Actual Communications Technical Performance: 2009-2012**



**CPDLC Actual Communications Performance: 2009-2012**

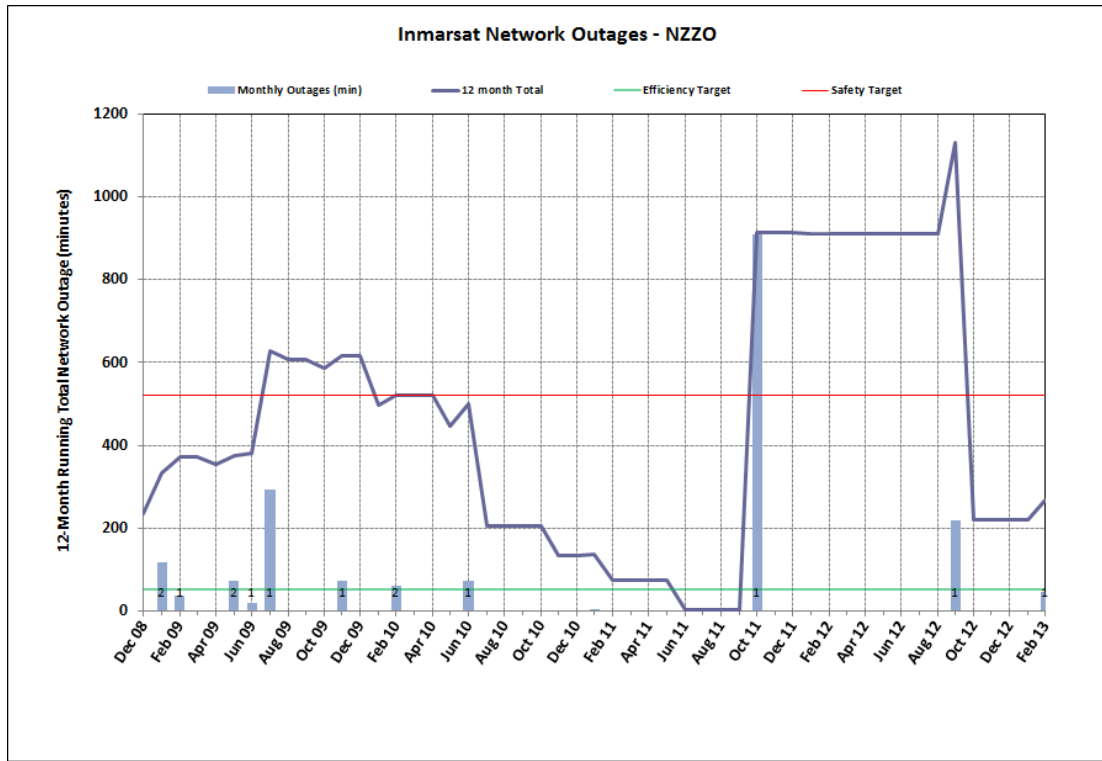


CPDLC – Getting Better

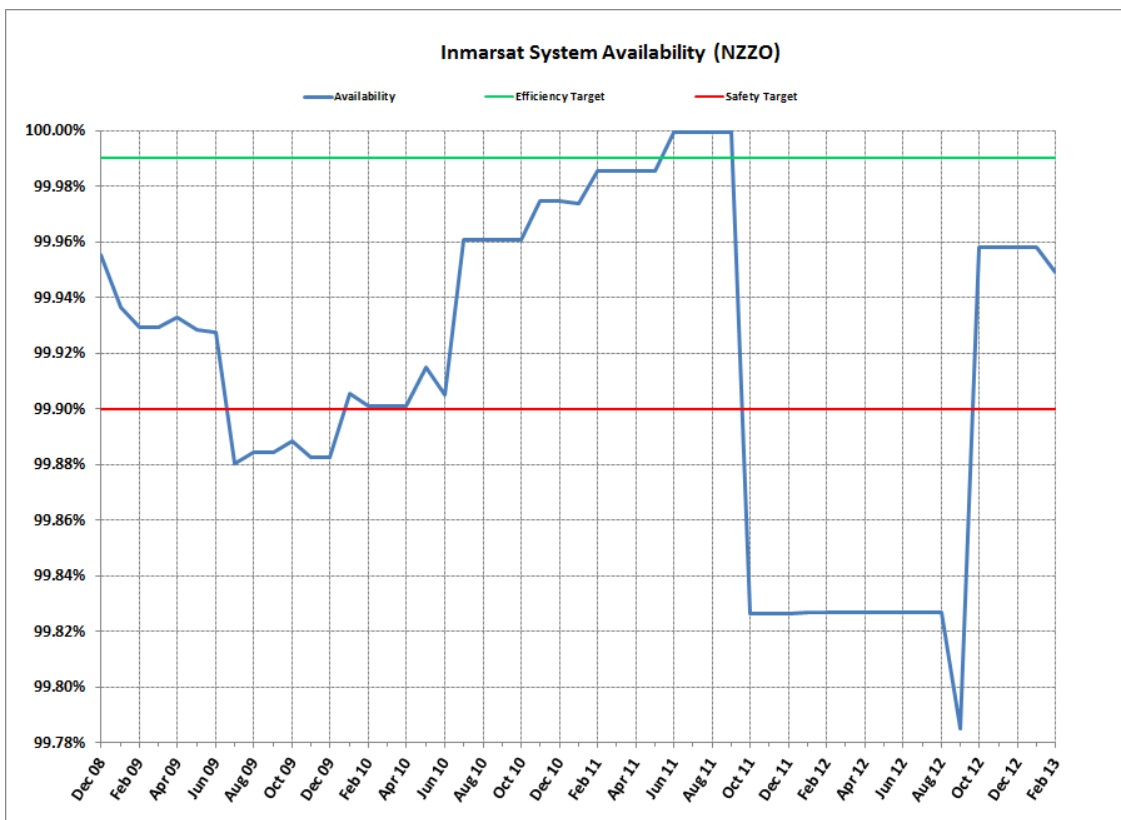




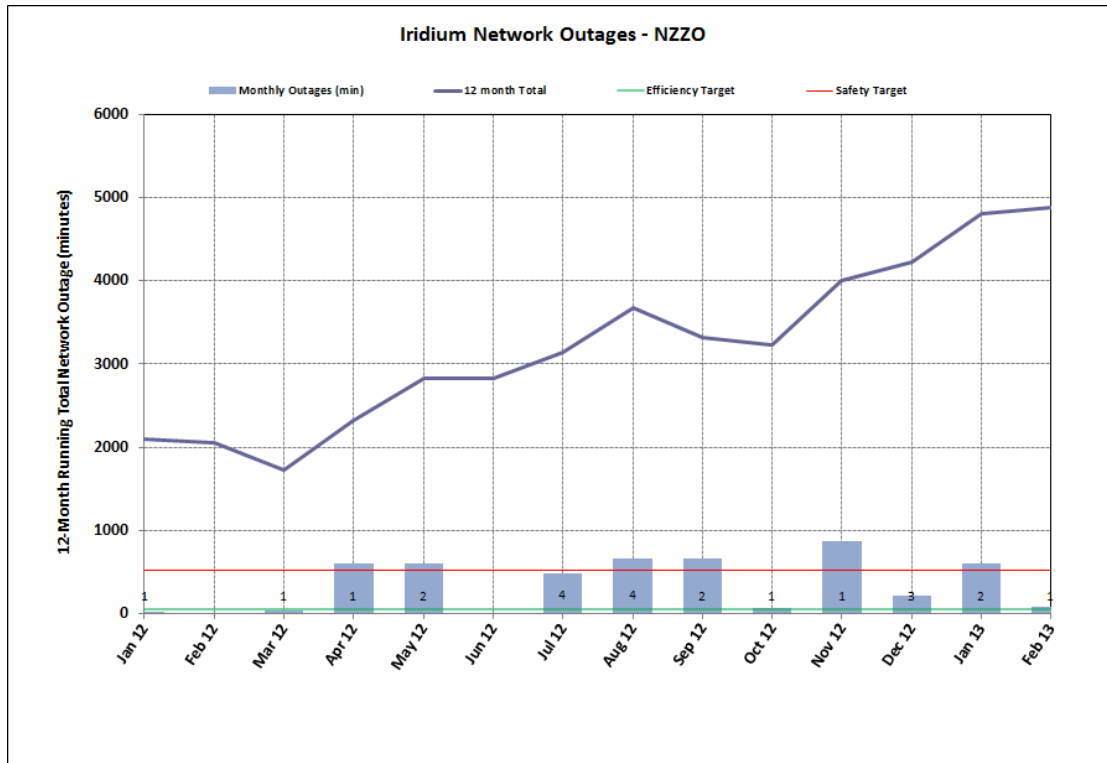
**Inmarsat Availability : Network Outages**



**Inmarsat Availability**



**Iridium Availability: Network Outages**



**Iridium Availability: System Availability**

