



FANS Interoperability Team Meeting (FIT/18)

Honolulu, Hawaii, USA, 22-23 March 2011

Agenda Item 4 – Working Papers

A388 Performance Update

Presented by Airways New Zealand

SUMMARY

In September 2010 a FANS1/A performance review was completed on A388 operations in NZZO. The review is available as an attachment to WP #2. This paper provides an update on observed A388 performance during January and February 2011.

1. INTRODUCTION

- 1.1. This paper provides information on the current performance of the QANTAS A388 fleet operating on UPR routes between Australia and the United States.
- 1.2. Data from the Oakland (KZAK) and Auckland (NZZO) FIR obtained during the period January - February 2011 was analysed for this paper. The analysis is in accordance with the guidelines of the GOLD Appendix D.
- 1.3. Airways would like to acknowledge the FAA for making KZAK performance data available for this analysis.

2. DISCUSSION

CPDLC Performance

- 2.1 The fleet meets RCP240 requirements for the application of reduced separations when using SATCOM. The issue regarding the use of HF DL for CPDLC uplinks reported in the September 2010 review has been resolved and no HF DL was used in the 306 CPDLC intervention transactions analysed for this paper.
- 2.2. The results of the analysis are tabulated in Figure 2-1 below. The fleet better the 99.9% requirements for both Required Communications Technical Performance (RCTP) and Required Communications Performance (RCP) with 100% of the transactions completed within the required time period. Pilot Operational Response Time (PORT) meets the requirement that 95% of responses are sent within 60 seconds. The performance observed sees 98% of the responses sent within 60 seconds which is similar to the 97% observed in the September review.

A388 Datalink Performance		
KZAK NZZO FIR January February 2011		
CPDLC SATCOM # 306		
ACTP RCP240	120sec	99.67%
	150sec	100.00%
ACP RCP240	180sec	100.00%
	210sec	100.00%
PORT	60sec	98.04%
ADS-C SATCOM # 4209		
RSP 180	90sec	99.67%
	180sec	99.95%
ADS-C SATCOM + HF # 4443		
RSP 180	90sec	98.90%
	180sec	99.73%
ADS-C HF # 234		
RSP 180	90sec	85.04%
	180sec	95.73%

Figure 2-1 A388 performance KZAK NZZO FIR Jan-Feb 2011

2.3. Graphs for RCP240 Actual Communications Technical Performance (ACTP) and Actual Communications Performance (ACP) are included in Appendix A to this paper.

ADS-C Performance

2.4. The fleet meets the RSP180 requirements for the application of reduced separations when using SATCOM. The results are tabulated in Figure 2-1 above with 99.95% of the 4209 ADS-C reports analysed received within the 99.9% 180 second requirement.

2.5. The A388 operates using HF DL in a “next-on-busy” mode and HF DL was used for 234 ADS-C reports during the review period. An analysis of the “pure” HF DL transactions falls well under the RSP180 requirements. However, if the SATCOM and HF DL reports are combined performance meets the RSP180 normal operations 95% 90 second requirement and is very close to meeting the 99.9% 180 second requirement with 99.7% of reports delivered within the 180 second requirement.

2.6. Graphs for RSP180 Actual Surveillance Performance are included in Appendix A to this paper.

ADS-C Delay Analysis

2.7. An analysis of all messages delivered in more than 90 seconds shows that 80% of the 50 delayed reports fall near to the NZZO FIR boundary where it would be normal for both the adjacent FIR and NZZO to have established ADS-C contracts. A

geographic picture of the delayed reports in the vicinity of the NZZO boundary is included in Appendix A to this paper.

2.8. An analysis of 5 delayed ADS-C waypoint reports received at both KZAK and NZZO is depicted in Figure 2-2 below. One of each report pair is delivered via SATCOM the other via HF DL. There are significant delays evident in the reports that are delivered by HF DL. Previous analysis of the same waypoint report delivered to multiple FIR by SATCOM has shown that there is around a 15 second latency delay between reports. This is significantly less than the delays seen with HF DL.

FIR	Date	RGS	Report Type	Lat	Lon	Latency (Seconds)
KZAK	20110124	H16	WPR	-4.994000	-161.492	405
NZZO	20110124	POR1	WPR	-4.994000	-161.492	15
KZAK	20110124	H16	WPR	-5.99527	-162.993	259
NZZO	20110124	POR1	WPR	-5.99527	-162.993	11
KZAK	20110126	POR1	WPR	-4.99552	-160.744	13
NZZO	20110126	H09	WPR	-4.99552	-160.744	178
KZAK	20110215	POR1	WPR	-4.99535	-163.962	11
NZZO	20110215	H02	WPR	-4.99535	-163.962	157
NZZO	20110124	POR1	WPR	-3.99628	-159.994	13
KZAK	20110124	H16	WPR	-3.99628	-159.994	151

Figure 2-1 Latency delays for the same ADS-C Waypoint Report to different FIR

2.9. It seems that the majority of delays observed are with waypoint reports near FIR boundary where multiple FIR have contracts. This was also observed in the September report.

3. ACTION BY THE MEETING

3.1. The meeting is invited to:

- a) Note the improvement in A388 performance observed during January and February 2011 in the KZAK and NZZO FIR.
- b) Note the delays observed in the delivery of the same ADS-C report to different FIR using mixed media.

Appendix A : Additional performance data

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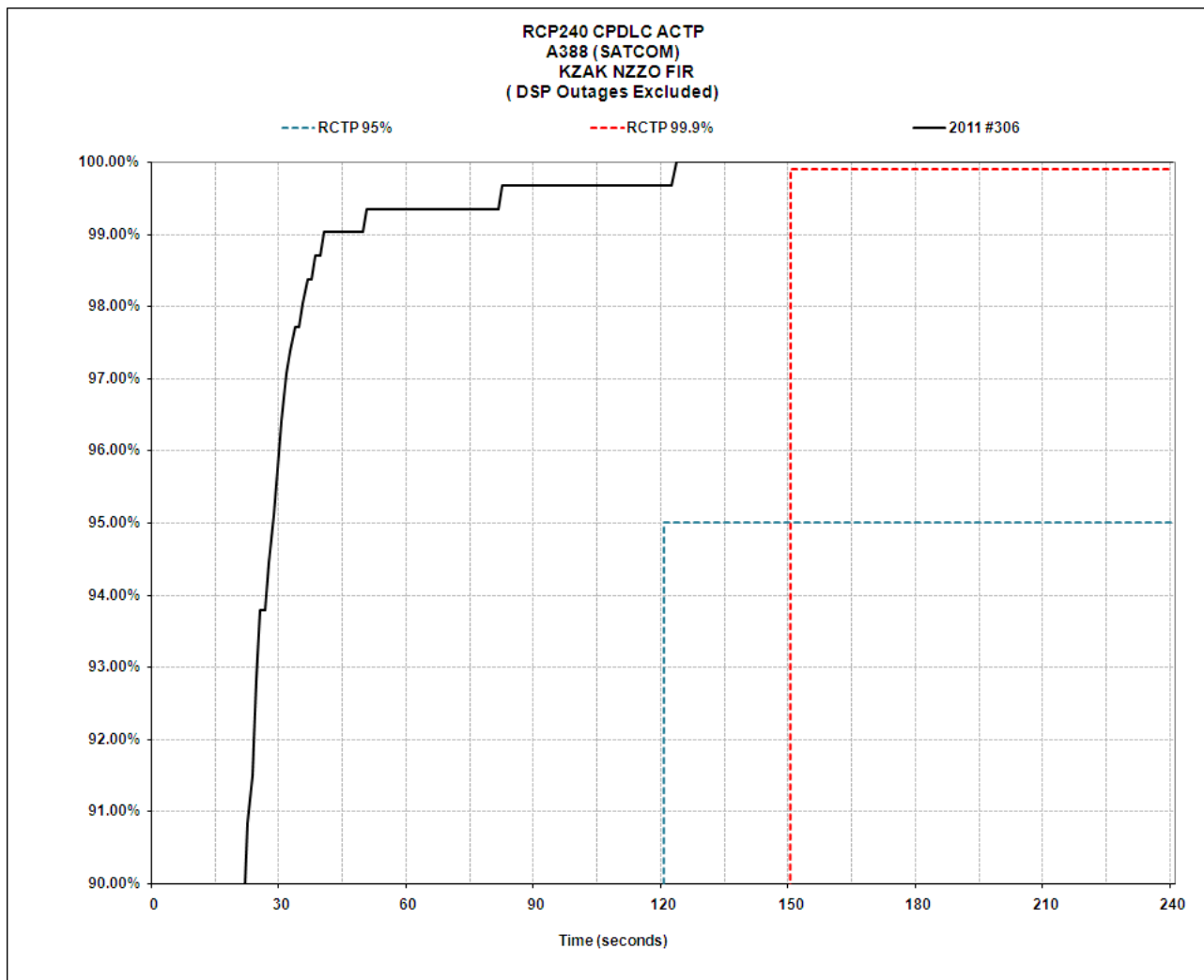


Figure A-1 A388 CPDLC ACTP

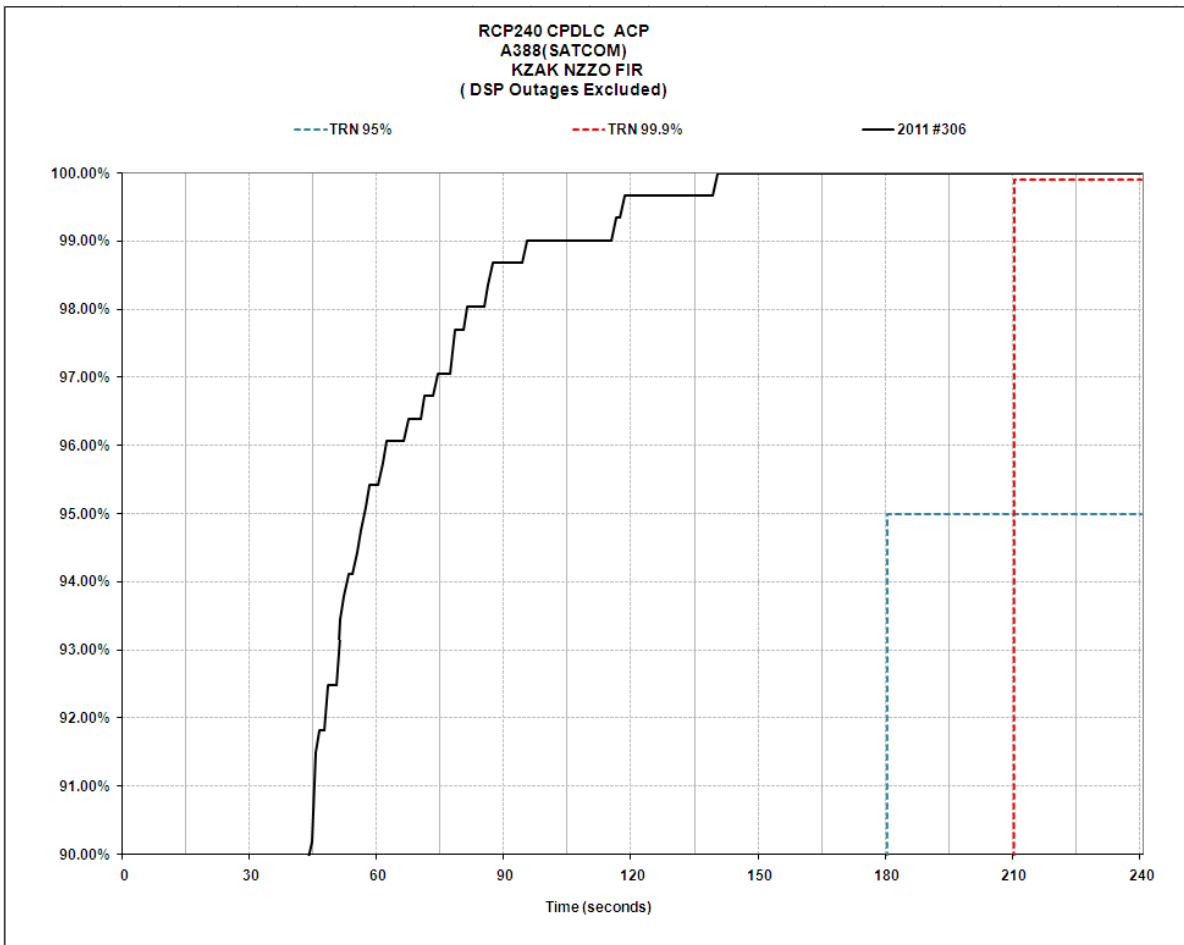


Figure A-2 A388 CPDLC ACP

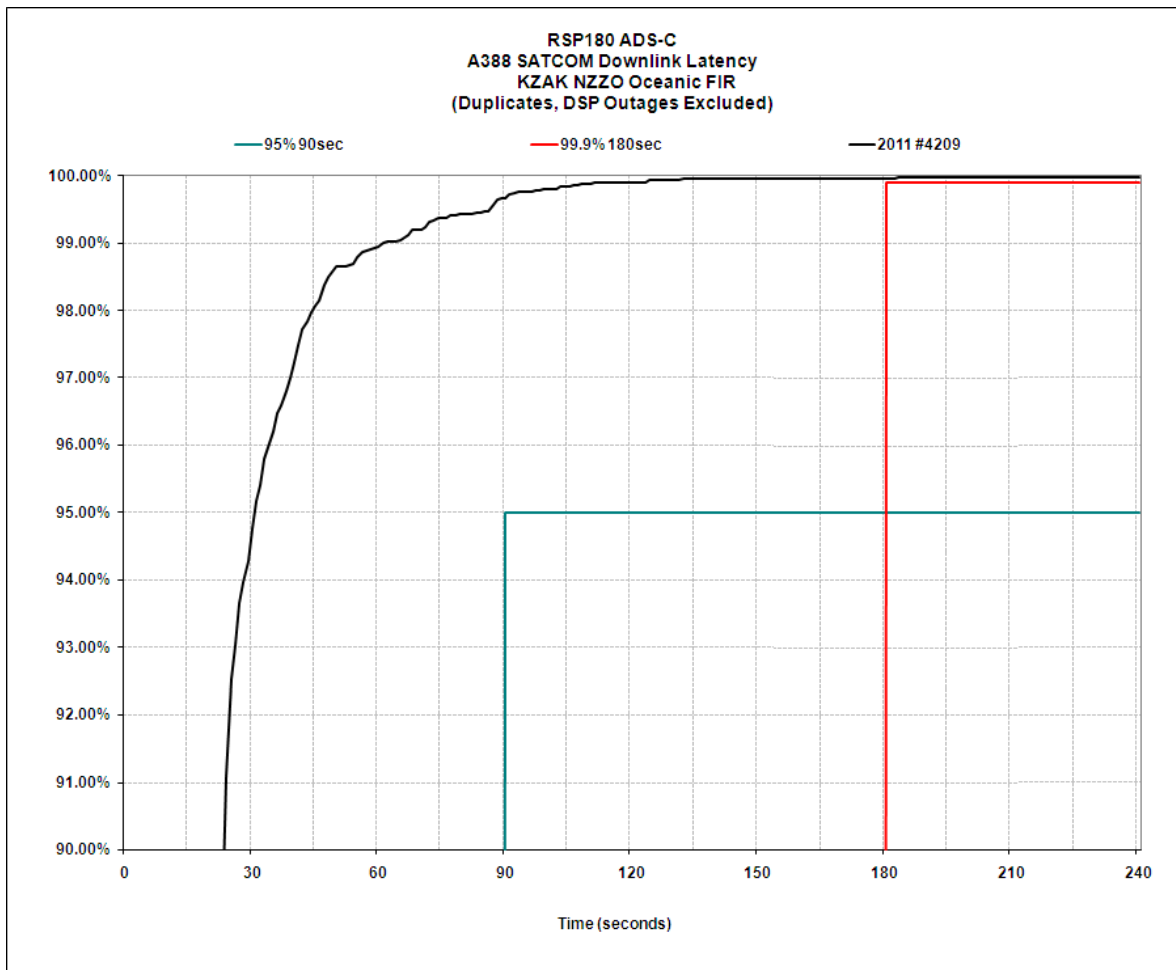


Figure A-3 A388 ADS-C SATCOM Downlink Latency

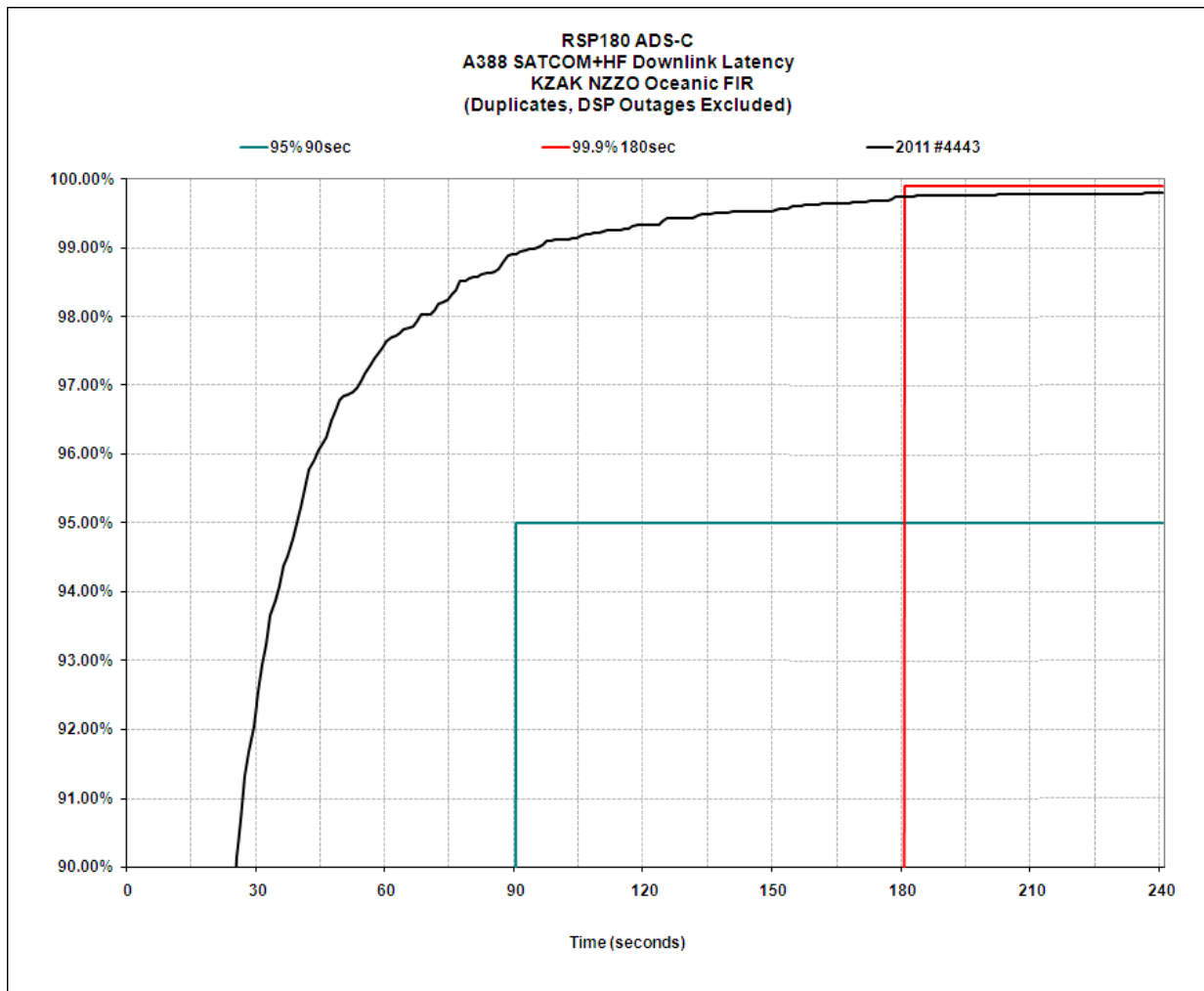


Figure A-4 A388 ADS-C SATCOM + HF Downlink Latency

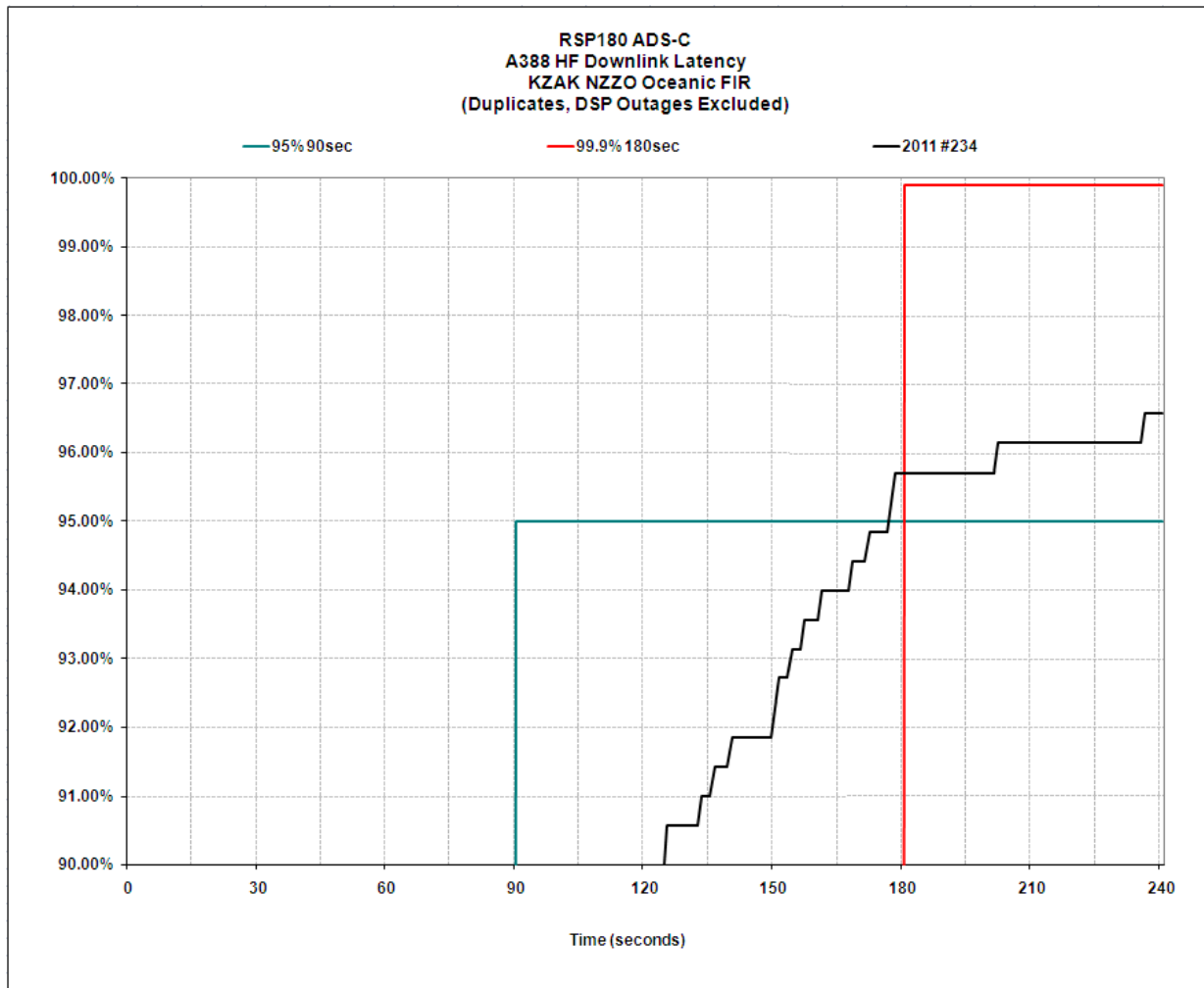


Figure A-5 A388 ADS-C HF Downlink Latency

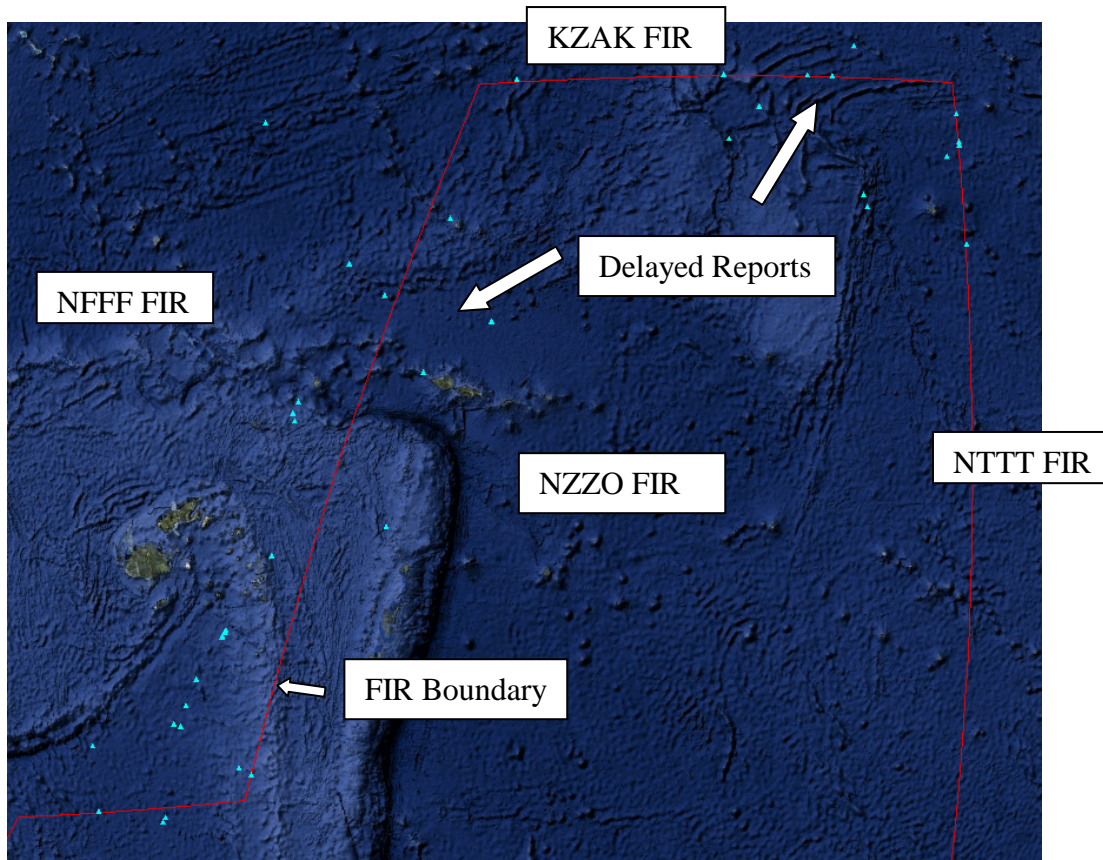


Figure A-6 A388 ADS-C Delayed Reports near FIR Boundary