



Web-Based Analysis: Airways New Zealand

Global Operational Data Link (GOLD)

Familiarization with Performance Based Communications
and Surveillance (PBCS) Workshop

Dakar, Senegal 11-15 September 2017

Prepared by:
FAA WJH Technical Center
Separation Standards Analysis Branch
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FAA



Federal Aviation
Administration

Overview

- The attached presentation was provided by Air New Zealand for group review at FIT-Asia/6
- The presentation is a review of their PBCS on-line analysis tool

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On-Line Analysis Tool - Update



FIT-Asia 6
ICAO Asia and Pacific Office
Bangkok, Thailand
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What we will cover today

- Recent updates to PBCS on-line analysis tool
 - Combined report function
 - Performance improvements



Combined report

Combined Report



ATSP Report Type Data Point Threshold

Date From Date To Filter

Note:

1. ATSP – select one or more ATSP’s data that is available in the database
2. Report Type – select “operator” to give analysis by aircraft operator/aircraft type
- select “tail” to give analysis by aircraft registration (tail number)
3. Data Point Threshold – select “0” or “100” or “500” or “1000” to give minimum data points assessed.
4. Date From Date To – select date range required
5. Filter – select FULL or RESTRICTED for RCP240 analysis (Restricted allows for measure of communications transfer instructions as allowed in PBCS Manual guidance if larger data set required)
6. Export data – activates data extraction.



Combined report

Combined Report

ATSP
Report Type
Data Point Threshold

Date From
Date To
Filter



Do you want to open or save PBCS_combined_report.csv from pbcanalysis.herokuapp.com?



Operator/Air Type	ADS-C downlink Message counts	ASP <= 90 sec	ASP <= 180 sec	CPDLC Transaction Counts (WILCO received)	ACP <= 180 sec	ACP <= 210 sec
B77W	7001	99.59%	99.76%	323	99.38%	99.38%
B788	7615	99.46%	99.63%	318	99.69%	99.69%
B77L	231	98.70%	99.57%	-	-	-
A320	1423	93.32%	96.98%	-	-	-
A332	1561	99.68%	100.00%	-	-	-
B772	29105	99.70%	99.89%	1274	99.69%	99.69%
B77W	29547	99.51%	99.78%	1411	99.50%	99.72%
B789	32119	99.08%	99.77%	968	99.59%	99.79%
A332	3468	99.54%	99.65%	-	-	-



Performance Improvements

- Recent performance improvements to PBCS on-line analysis tool include:
 - Reducing the upload time required for .csv files.
 - Reduce processing time for tabular data extraction.



Additional slides

PBCS on-line tool



- The tool has been designed so that it may be used by more than one ANSP
- Tool allows for aggregation of regional performance data.
- The tool outputs data in graphical format (cumulative frequency distributions) and also in tabular form similar to the formats described in the PBCS guidance material.

Importing .csv data

- Overview
- Import ADS-C CSV**
- Clean Imported ADS-C Data
- ADS-C Graphs
- ADS-C Tabular
- Import CPDLC CSV
- Clean Imported CPDLC Data
- CPDLC Graphs
- Delete ADS-C Data
- Delete CPDLC Data
- Admin Interface

Import Data

Select CSV File to upload :

Choose File to Upload

« FANSIA » RCP Monitoring » 2015 » ADS-C Latency » Search ADS Latency

Name	Date modified	Type	Size
ADS 2015 RSP400 Different M...a.xlsx	4/07/2014 3:23 p.m.	Microsoft Excel W...	771 KB
ADS ACI LAN THT by month...5.xlsx	5/07/2014 5:07 a.m.	Microsoft Excel W...	448 KB
ADS ANZ by month 2015.xls	22/01/2016 11:07 a...	Microsoft Excel W...	734 KB
ADS FJI CAL CSN HAL by m...h 2015.xlsx	5/07/2014 5:10 a.m.	Microsoft Excel W...	976 KB
ADS JST QFA by month 2015...	5/07/2014 5:14 a.m.	Microsoft Excel W...	1,092 KB
ADS SIA MAS KAL THA by r...th 2015.xl...	5/07/2014 5:17 a.m.	Microsoft Excel W...	1,078 KB
ADS UAE by month 2015.xls	5/05/2015 7:50 a.m.	Microsoft Excel W...	891 KB
ADS UAL DAL OTHER MIL b...h 201...	5/07/2014 5:21 a.m.	Microsoft Excel W...	811 KB
ADS VOZ CPA CLX by month...5.xlsx	5/07/2014 5:23 a.m.	Microsoft Excel W...	509 KB
ads_downlink_201501.csv	5/03/2016 9:41 a.m.	Microsoft Excel C...	2,578 KB
ads_downlink_201501.xls	2/02/2015 11:16 a.m.	Microsoft Excel 97...	8,541 KB
ads_downlink_201501_data.xlsx	5/03/2016 9:42 a.m.	Microsoft Excel W...	27,289 KB
ads_downlink_201502.csv	10/03/2016 6:32 a....	Microsoft Excel C...	2,360 KB
ads_downlink_201502.xls	3/03/2015 10:08 a....	Microsoft Excel 97...	7,029 KB
ads_downlink_201502_data.xlsx	2/03/2016 12:24 p....	Microsoft Excel W...	26,510 KB
ads_downlink_201503.csv	10/03/2016 6:48 a....	Microsoft Excel C...	2,420 KB

File name: ads_downlink_201502.csv All Files (*.*)

Overview

Import ADS-C CSV

Clean Imported ADS-C Data

ADS-C Graphs

ADS-C Tabular

Import Data

Select CSV File to upload :

S:\FANS1AIRCP Monitoring\2015\A Browse...

Import

Downlink Delay Analysis

Settings Profile Help

Overview

Import ADS-C CSV

Clean Imported ADS-C Data

ADS-C Graphs

ADS-C Tabular

Import CPDLC CSV

Clean Imported CPDLC Data

CPDLC Graphs

Delete ADS-C Data

Delete CPDLC Data

Admin Interface

Importing CSV Data



23537 of 33453 records loaded

Time to completion : 1 minute 6 seconds



Clean/Filter imported data

- Shows all imported data , sort, review , view invalid records
- Fix missing type/company for tail number.
- Find and designate bad tails and outages.

Overview

Import ADS-C CSV

Clean Imported ADS-C Data

ADS-C Graphs

ADS-C Tabular

Import CPDLC CSV

Clean Imported CPDLC Data

CPDLC Graphs

Delete ADS-C Data

Delete CPDLC Data

Admin Interface

Clean Imported Data

Copy Imported Data to Main Database

Imported Raw ADS-C Data

Show entries

Search:

Line	ATSP	AC Company	AC Type	Tail No	Date	RGS	Latitude	Longitude	Report Type	Aircraft Time	OCS Time	Duration	Designation	RGS type
1	NZZO	ACA	B77W	CFITU	20150102	XXP	-32.312508	160.530334	P	02:58:33	02:59:01	28	NORMAL	SAT
2	NZZO	ACA	B77W	CFITU	20150102	XXP	-31.017151	162.30188	P	03:12:30	03:12:45	15	NORMAL	SAT
3	NZZO	ACA	B77W	CFITU	20150102	XXP	-30.494614	163.007065	W	03:18:04	03:18:11	7	NORMAL	SAT
4	NZZO	ACA	B77W	CFITU	20150102	XXP	-30.409813	163.296143	P	03:19:53	03:20:00	7	NORMAL	SAT
5	NZZO	ACA	B77W	CFITU	20150102	NLK1	-29.426022	166.709457	P	03:41:14	03:41:18	4	NORMAL	VHF
6	NZZO	ACA	B77W	CFITU	20150102	NLK1	-29.042358	167.933746	W	03:48:59	03:49:04	5	NORMAL	VHF
7	NZZO	ACA	B77W	CFITU	20150102	NLK1	-27.960205	169.850861	P	04:02:34	04:02:39	5	NORMAL	VHF
8	NZZO	ACA	B77W	CFITU	20150102	XXP	-26.227112	172.743179	P	04:23:54	04:24:01	7	NORMAL	SAT
9	NZZO	ACA	B77W	CFITU	20150102	XXP	-23.378735	177.165863	P	04:57:21	04:57:36	15	NORMAL	SAT
10	NZZO	ACA	B77W	CFITU	20150102	XXP	-22.646427	178.247513	P	05:05:37	05:06:02	25	NORMAL	SAT
11	NZZO	ACA	B77W	CFITU	20150102	XXP	-21.425056	-179.996399	W	05:19:21	05:19:38	17	NORMAL	SAT
12	NZZO	ACA	B77W	CFITU	20150102	XXP	-20.736694	-179.043503	P	05:26:57	05:27:04	7	NORMAL	SAT
13	NZZO	ACA	B77W	CFITU	20150102	XXP	-19.520645	-177.3983	W	05:40:12	05:40:28	16	NORMAL	SAT

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- Delete ADS-C Data
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- Admin Interface

97	NZZO	ACI	A332	FOHSD	20150101	POR1	-24.08083	-174.376541	P	01:57:14	01:57:29	15	NORMAL	SAT
98	NZZO	ACI	A332	FOHSD	20150101	POR1	-24.023151	-170.768219	P	02:18:34	02:18:50	16	NORMAL	SAT
99	NZZO	ACI	A332	FOHSD	20150101	POR1	-23.997402	-169.995224	W	02:23:07	02:23:27	20	NORMAL	SAT
100	NZZO	ACI	A332	FOHSD	20150101	POR1	-23.515892	-167.232681	P	02:39:55	02:40:09	14	NORMAL	SAT

Showing 1 to 100 of 33,453 entries

Find Outages/Bad-Tails

Duration Range :



From Line
(Click):
Selected_Tail

To (Alt-Click):
To (Ctrl-Click):

Fix missing AC Type/AC Company

Tail Number:

AC Type:

AC Company:

Invalid data to be discarded

Show entries

Search:

Line	ATSP	AC Company	AC Type	Tail No	Date	RGS	Latitude	Longitude	Report Type	Aircraft Time	OCS Time	Duration	Designation	RGS type
No data available in table														

Showing 0 to 0 of 0 entries

Copy Imported Data to Main Database

Search:

Report Type	Aircraft Time	OCS Time	Duration	Designation	RGS type
P	02:58:33	02:59:01	28	NORMAL	SAT
P	03:12:30	03:12:45	15	NORMAL	SAT
W	03:18:04	03:18:11	7	NORMAL	SAT
P	03:19:53	03:20:00	7	NORMAI	SAT

Copy Imported Data to Main Database



Once you have finished correcting and errors you may copy this data to the main database.

Are you sure you wish to proceed?

Copy data

Continue cleaning data

Downlink Delay Analysis

Overview

Import ADS-C CSV

Clean Imported ADS-C Data

ADS-C Graphs

ADS-C Tabular

Import CPDLC CSV

Clean Imported CPDLC Data

CPDLC Graphs

Delete ADS-C Data

Delete CPDLC Data

Admin Interface

Data Transfer Complete



All data transferred from Import table to Main database.




Moved 33453 records.



ADS-C Graphical RSP Analysis

FIT-Asia/6-SP03
03-05/07/2017

Downlink Delay Analysis

Settings  Profile  Help 

Overview

Import ADS-C CSV

Clean Imported ADS-C Data

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Import CPDLC CSV

Clean Imported CPDLC Data

CPDLC Graphs

Delete ADS-C Data

Delete CPDLC Data

Admin Interface

Series 1

Series Name	Aircraft Company	Aircraft Type	Tail Number
<input type="text" value="Series 1"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Designation	RGS Type	ATSP	Display Series
<input type="text" value="✕ NORMAL ✕"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>

Series 2

Series 3

Series 4

Series 5

Series 6

Series 7

Series 8

Series 9

Chart Title




<input type="text" value="Title"/>	Sub-title	Date From	Date To
<input type="text" value="Chart Sub-title"/>	<input type="text"/>	<input type="text" value="2016-11-01"/> 	<input type="text" value="2016-12-31"/> 

Chart Minimum Y-value

<input type="text" value="90"/>	Chart Minimum Y-value	RSP
<input type="text" value="240"/>	<input type="text"/>	<input type="text" value="RSP180"/> 

ADS-C Graphical data page:

- Select RSP180 or RSP400.
- Select display of 9 series to graph by company, type, tail, RGS type, ATSP
- Name title/subtitle
- Select date range
- Select graph Y axis range



ADS-C Graphical RSP Analysis

- Overview
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- Delete CPDLC Data
- Admin Interface

Graphical Data Selection

ANZ B772 - SATCOM

Series Name ANZ B772 - SATCOM	Aircraft Company *ANZ	Aircraft Type *B772	Tail Number
Designation *NORMAL x	RGS Type *SAT x	ATSP *NZZO	Display Series x <input checked="" type="checkbox"/>

ANZ B772 - VHF

Series Name ANZ B772 - VHF	Aircraft Company *ANZ	Aircraft Type *B772	Tail Number
Designation *NORMAL x	RGS Type *VHF x	ATSP *NZZO x	Display Series <input checked="" type="checkbox"/>

Series 3

Series 4



ADS-C Graphical RSP Analysis

FIT-Asia/6-SP03
03-05/07/2017

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ANZ B772 VHF

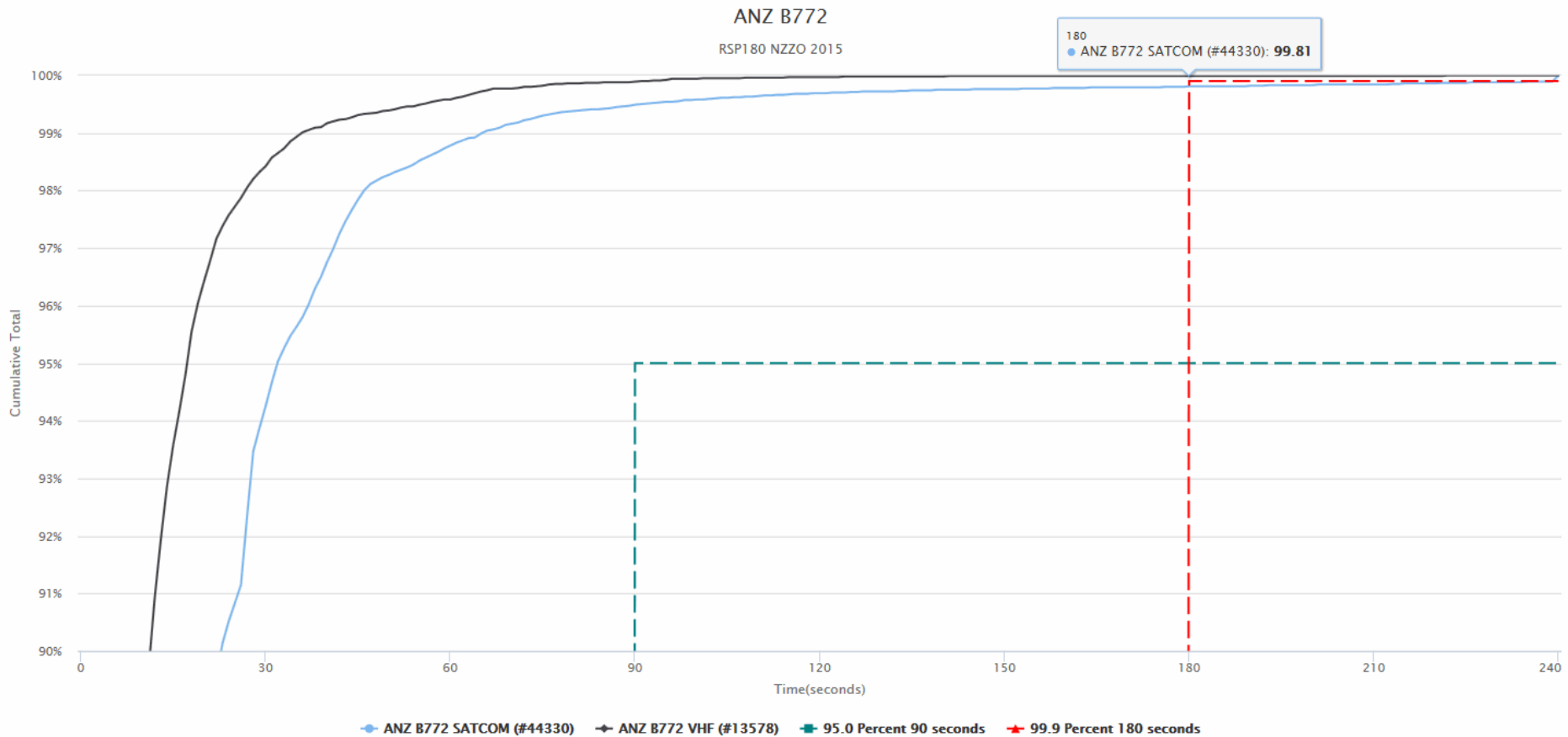
Series Name	Aircraft Company	Aircraft Type	Tail Number
<input type="text" value="ANZ B772 VHF"/>	<input type="text" value="* ANZ"/>	<input type="text" value="* B772"/>	<input type="text"/>
Designation	RGS Type	ATSP	Display Series
<input type="text" value="* NORMAL"/> x	<input type="text" value="* VHF"/> x	<input type="text" value="* NZZO"/> x	<input checked="" type="checkbox"/>

- Series 3
- Series 4
- Series 5
- Series 6
- Series 7
- Series 8
- Series 9

Chart Title	Sub-title	Date From	Date To
<input type="text" value="ANZ B772"/>	<input type="text" value="RSP180 NZZO 2015"/>	<input type="text" value="2015-01-01"/>	<input type="text" value="2015-12-31"/>
Chart Minimum Y-value	Chart Minimum Y-value	RSP	
<input type="text" value="90"/>	<input type="text" value="240"/>	<input type="text" value="RSP180"/>	

ADS-C Graphical RSP Analysis

Selected Graph



Highcharts.com



ADS-C Tabular RSP Analysis

ADS-C Tabular data page

- Select company,
- Select Aircraft Type,
- Select RGS,
- Select media type.
- Date range

ADS-C Tabular Data Selection

The screenshot shows a web interface for selecting ADS-C tabular data. It features several input fields and checkboxes:

- Aircraft Company:** A text box containing "ANZ".
- Aircraft Type:** A text box containing "B772".
- RGS:** An empty text box.
- Show each:** Three checkboxes, all of which are unchecked.
- Title:** A text box containing "ANZ B772 RSP 01 JANUARY 2015".
- Date From:** A text box containing "2015-01-01".
- Date To:** A text box containing "2015-12-31".
- Media Type:** A text box containing "SATCOM All" and "VHF All".
- Display Table:** A button located at the bottom left of the form.

Blue arrows from the text above point to the following fields:

- From "Select company," to the Aircraft Company field.
- From "Select Aircraft Type," to the Aircraft Type field.
- From "Select RGS," to the RGS field.
- From "Select media type." to the Media Type field.
- From "Date range" to the Date From and Date To fields.
- From "Add Title" to the Title field.
- From "Display Selected Table" to the Display Table button.

- Add Title
- Display Selected Table

- Filter displayed table to remove rows of less than specified number of messages.

Media Type

× SATCOM All × VHF All

Display Table

Hide Rows Fewer Than




1



ADS-C performance in NZZO FIR						
Colour Key		Period 01 Jan 15 - 31 Dec 15			95% RSP180 Benchmark	99.9% RSP180 Benchmark
■	Meets Criteria					
■	99.0%-99.84%					
■	Under Criteria					
Media Type	RGS	Aircraft Type	Operating Company	Message Count	RSP <= 90 sec	RSP <= 180 sec
ANZ B772 RSP180 NZZO 2015						
SATCOM All	All	B772	ANZ	44330	99.49	99.81
VHF All	All	B772	ANZ	13578	99.90	99.99

Typical ADS-C Tabular RSP Analysis




FIT-Asia/6-SP03
03-05/07/2017

ADS-C performance in NZZO FIR						
Colour Key	Period 01 Jan 15 - 31 Dec 15				95% RSP180 Benchmark	99.9% RSP180 Benchmark
	 Meets Criteria					
 99.0%-99.84%						
 Under Criteria						
Media Type	RGS	Aircraft Type	Operating Company	Message Count	RSP <= 90 sec	RSP <= 180 sec
ANZ B772 RSP180 NZZO 2015						
SATCOM All	All	B772	ANZ	44330	99.49	99.81
VHF All	All	B772	ANZ	13578	99.90	99.99



Typical ADS-C Tabular RSP Analysis

FIT-Asia/6-SP03
03-05/07/2017

ADS-C performance in NZZO FIR						
Media Type	RGS	Aircraft Type	Operating Company	Message Count	95% RSP180 Benchmark	99.9% RSP180 Benchmark
					RSP <= 90 sec	RSP <= 180 sec
Colour Key  Meets Criteria  99.0%-99.84%  Under Criteria						
Period 01 Jan 15 - 31 Dec 15						
Analysis by						
SATCOM All	All	A332	CAL	5612	99.11	99.41
SATCOM All	All	A332	CCA	127	98.43	98.43
SATCOM All	All	A332	CES	1349	99.48	99.78
SATCOM All	All	A332	CSN	4651	99.57	99.68
VHF All	All	A332	CAL	1709	99.59	99.71
VHF All	All	A332	CCA	122	99.18	99.18
VHF All	All	A332	CES	1328	99.62	99.85
VHF All	All	A332	CSN	1712	99.47	99.77
HF All	All	A332	CCA	21	80.95	95.24
HF All	All	A332	CES	118	88.14	97.46
HF All	All	A332	CSN	153	76.47	91.50

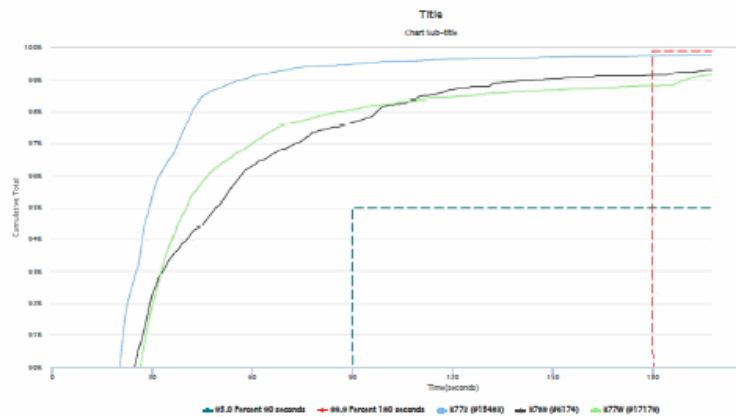


Printing graphs and tables

- Tool uses the normal print capability available in most browsers

Graphical Data Selection

Selected Graph



1/05/2016

ADS-C Tabular Data Selection

ADS-C performance in NZZO FIR						
Colour Key					95% RSP180 Benchmark	99.9% RSP180 Benchmark
<input type="checkbox"/> Meets Criteria		Period 01 Mar 16 - 31 Mar 16				
<input type="checkbox"/> 99.0% -99.84%						
<input type="checkbox"/> Under Criteria						
Media Type	RGS	Aircraft Type	Operating Company	Message Count	RSP <= 90 sec	RSP <= 180 sec
Analysis by						
SATCOM I4	APK1	B789	ANZ	185	94.59	95.68
SATCOM I4	AME1	B77W	ANZ	471	99.58	100.00
SATCOM I4	APK1	B77W	ANZ	4679	97.67	98.31
SATCOM MTSAT	MTS1	B789	ANZ	1904	96.74	99.79

Thank you

