INTERNATIONAL CIVIL AVIATION ORGANIZATION

ESAF AND WACAF OFFICE

TERMES OF REFERENCE
AFI DATA LINK CENTRAL MONITORING AND REPORTING AGENCY

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Terms of reference for AFI Data Link Monitoring and Reporting Agency (AFI DLMRA)

Introduction

The AFI Data Link Central Monitoring and Reporting Agency (AFI DL/CMRA) will report to APIRG with respect to data link implementation, trials and operations.

After an ATM operation predicated on the RCP/RSP specification becomes operational, AFI DL/CMRA should ensure that the communication and surveillance systems continue to operate successfully as a whole to ensure efficient and safe operations.

To determine continued operational compliance, AFI DL/CMRA should monitor communication and surveillance capabilities in the applicable airspace to detect and correct performance degradations due to potential instabilities or variations in overall system performance, or changes to any of the various subsystems.

It will receive and process routine and ad-hoc data and problem reports from end users and interested parties.

The main tasks of the AFI DLMRA are:

Part I. Problem analysis and resolution as per D.3 of the GOLD Manual, which includes:

1. A means for reporting e.g a web-based service
2. Diagnose problems and recommend resolutions
3. Co-ordinate problem reports and resolutions with other regional data link monitoring agencies.

Note 1: In the context of the ToR, provisions of D.3 and D.4 of the GOLD Manual are mandatory.

Note 2: The entity must enter into a confidential agreement with those stakeholders who require it to provide problem reports. Except as authorized by individual stakeholders, all problem reports and associated documentation shall be de-identified prior to distribution to members to protect the name and/or company originating the problem report. The entity must implement and maintain a program to protect confidential and sensitive information provided by AFI stakeholders. No identified data shall be kept longer than is essential to the successful resolution of the associated problem.

Part II. Problem analysis and resolution as per D.3 of the GOLD

D.3 Problem reporting and resolution

D.3.1 General

D.3.1.1 The working principles in this guidance material result from the combined experience from CPDLC and ADS-C implementation, worldwide. Many regions have formed a regional monitoring agency to manage the problem reporting and resolution process.

D.3.1.2 All stakeholders should be actively involved in the problem reporting and resolution process. It is essential that all aircraft operators in a region have the opportunity to become involved in the process and CMRA's should be pro-active in getting all aircraft operators and other stakeholders to register and participate in the process.

D.3.1.3 The problem identification and resolution process, as it applies to an individual problem, consists of a data collection phase, followed by problem analysis and coordination with affected parties to secure a resolution, and recommendation of interim procedures to mitigate the problem in some instances. This is shown in the Figure D-20.

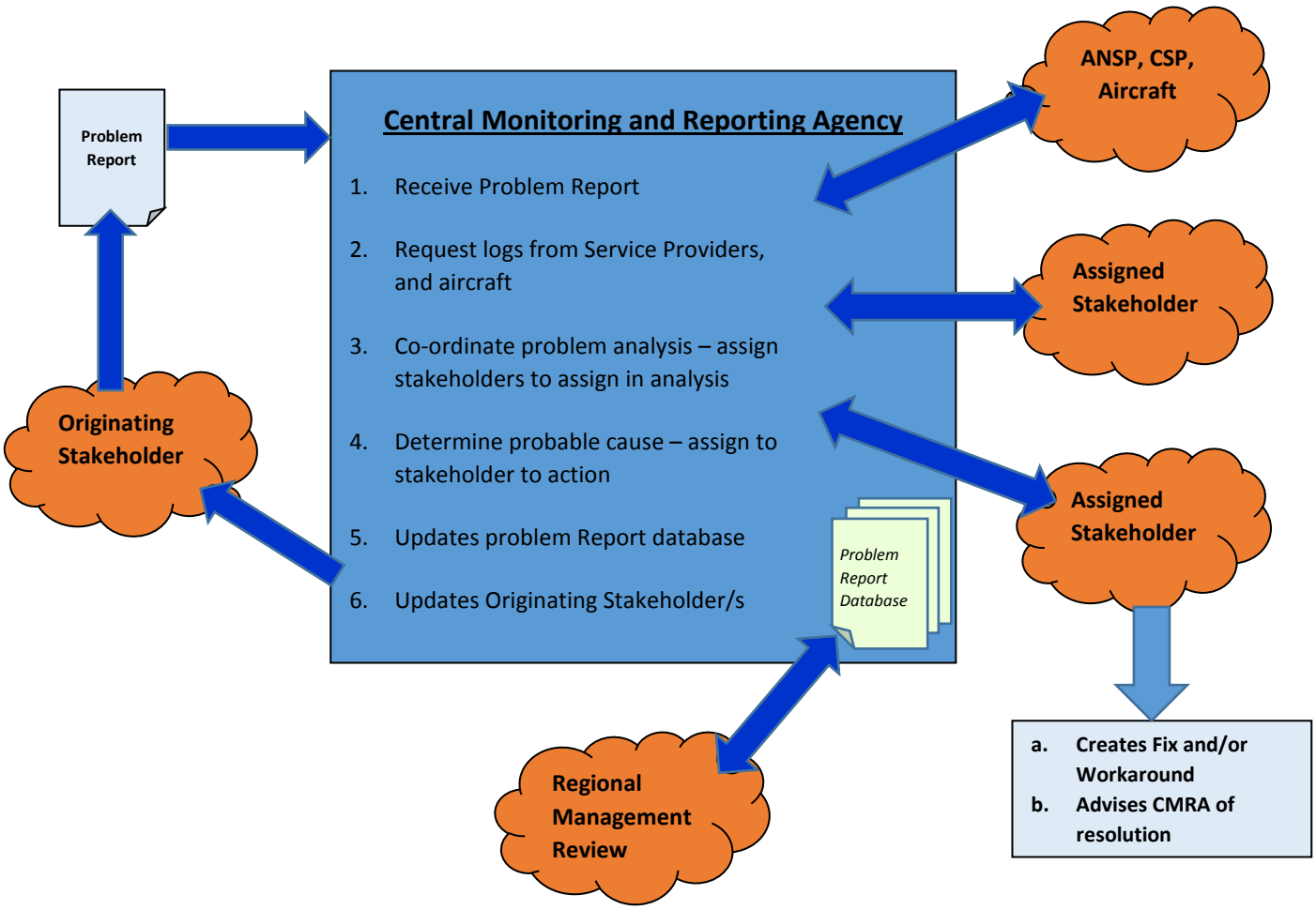


Figure D-13. Problem reporting and resolution process

D.3.2 Problem report form

D.3.2.1 The problem identification task begins with receipt of a problem report from a stakeholder, usually an operator, ANSP or CSP but may include aircraft or avionics manufacturers. Standard reporting forms should be developed and regions should investigate the use of a website to receive and store problem reports.

D.3.2.2 As an example, the AFI region has to use, a secured web-based problem reporting and tracking application, which should be managed by the AFI DL/CMRA. Problems should be reported, regardless whether it can be resolved locally or needs to be handled to promote knowledge sharing across the data link community of the AFI Region.

D.3.2.3 Each ANSP should establish means to collect and maintain operational performance data in the standardized data formats defined as per Appendix D for CPDLC and ADS-C of the PBCS Manual 9869.

D.3.2.4 Each ANSP within a region should identify the entity and focal point(s) for administering the AFI DL/CMRA programme to manage a regional problem reporting system and provide regional-level analysis and reporting of ANSP-monitored performance.

D.3.2.5 ANSP should report to the AFI DL/CMRA any problems that may have a regional or global impact, or affect aircraft operators in its airspace, including any non-compliance with an RCP/RSP specification.

D.3.2.6 AFI DL/CMRA should manage resources and any contracts, fund and recover costs and secure access to the services and information.

D.3.2.7 AFI DL/CMRA should establish a process that authorizes users, such as ANSPs, aircraft operators, CSPs, aircraft manufacturers, equipment suppliers and other participants to submit or access information. This process may include issuing a user ID and password associated with a unique security profile to a user requesting an account. This would ensure that each user is authorized to submit or access information, such as:

a) submitting problem reports and other ANSP-monitored information (e.g. summary reports or PBCS CSV data files, as necessary);

b) submitting other data supporting the problem investigation and analysis;

c) accessing relational databases that provide information specific to an operator, aircraft type, ANSP, CSP, SSP or message type; and

d) accessing standardized reports, such as status reports for management, civil aviation authorities (CAAs) or regional groups on an as-needed basis.

D.3.2.8 AFI DL/CMRA should validate submitted data before importing it into a secure centralized database and desensitize reports consistent with non-disclosure and security policies established for defining the security profile of authorized users.

D.3.2.9 AFI DL/CMRA should maintain relational data, such as related to the ANSP, CSP/SSP, aircraft type and aircraft operator.

D.3.2.10 An example of an online problem reporting form which will be on-line by the regional CMRA in the AFI region is shown in *Figure D-21*. The fields used in the form are as follows:

a) Originator's Reference Number: Originators problem report reference (e.g. ANZ_2009-23);

b) Title: A short title which conveys the main issue of the reported problem (e.g. CPDLC transfer failure);

c) Date UTC: Date in YYYYMMDD format (e.g. 20090705);

d) Time UTC: Time in HHMM (e.g. 2345);

e) Aircraft registration: ICAO flight plan aircraft registration (e.g. ZKADR);

f) Aircraft identification: ICAO flight plan call sign if applicable (e.g. NZA456);

g) Flight Sector: If applicable the departure and destination airfield of the flight (e.g. NZAA-RJBB);

h) Organization: Name of the originators organization (e.g. Airways NZ);

i) Active Center: Controlling Centre at time of occurrence if applicable (e.g. NZZO);

j) Next Center: Next controlling centre at time of occurrence if applicable (e.g. NFFF);

k) Position: Position of occurrence (e.g. 3022S16345E);

l) Problem Description: Detailed description of problem;

m) Attach File: Area of web page where originator and assigned stakeholders can attach data files or other detailed information such as geographic overlays; and

n) Additional Data: Area set aside for feedback from stakeholders assigned by the regional/State monitoring agency. This will includes the results of the investigation and the agreed action plan.

Note: A number of regional monitoring agencies are developing websites to manage the problem reporting process. Website addresses and the regional monitoring agency to which they are applicable are listed in Appendix E.

Form Details			
	Originators Reference Number		
Title			
Date UTC		Time UTC	
Registration		Flight Number	
Flight Sector			
Originator		Aircraft Type	
Organisation			
Active Center		Next Center	
Position			
Problem Description (box will expand as you type)			
Attach File		Browse... (click browse – do not type in this field)	
		Browse... (click browse – do not type in this field)	
		Browse... (click browse – do not type in this field)	
		Browse... (click browse – do not type in this field)	
		Browse... (click browse – do not type in this field)	
Additional Data			
Submit PR			

Figure D-21. Example on-line problem reporting form

D.3.3 Problem assessment

D.3.3.1 Data collection

D.3.3.1.1 The data collection phase consists of obtaining message logs from the appropriate parties (which will depend on which ANSPs and CSPs were being used and operator service contracts). Today, this usually means obtaining logs for the appropriate period of time from the CSPs involved. Usually, a log for a few hours before and after the event that was reported will suffice, but once the analysis has begun, it is sometimes necessary to request additional data, (perhaps for several days prior to the event if the problem appears to be an on-going one).

D.3.3.1.2 Additionally, some aircraft-specific recordings may be available that may assist in the data analysis task. These are not always requested initially as doing so would be an unacceptable imposition on the operators, but may occur when the nature of the problem has been clarified enough to indicate the line of investigation that needs to be pursued. These additional records include:

a) Aircraft maintenance system logs.

b) Built-In Test Equipment data dumps for some aircraft systems.

c) SATCOM activity logs.

d) Logs and printouts from the flight crew and recordings/logs from the ANSPs involved in the problem may also be necessary. It is important that the organization collecting data for the analysis task requests all this data in a timely manner, as much of it is subject to limited retention.

D.3.3.2 Data analysis

D.3.3.2.1 Once the data has been collected, the analysis can begin. For this, it is necessary to be able to decode all the messages involved, and a tool that can decode every ATS data link message type used in the region is essential. These messages include:

a) AFN (ARINC 622), ADS-C and CPDLC (RTCA DO-258/EUROCAE ED-100) in a region operating FANS-1/A.

b) Context Management, ADS-C and CPDLC applications (ICAO Doc 9705 and RTCA DO 280B/ED-110B).

c) ARINC 623 messages used in the region.

D.3.3.2.2 The analysis of the decoded messages requires a thorough understanding of the complete message traffic, including:

a) Media management messages.

b) Relationship of ground-ground and air-ground traffic.

c) Message envelope schemes used by the particular data link technology (ACARS, ATN, etc).

D.3.3.2.3 The analyst must also have a good understanding of how the aircraft systems operate and interact to provide the ATS data link functions, as many of the reported problems are aircraft system problems.

D.3.3.2.3 This information will enable the analyst to determine a probable cause by working back from the area where the problem was noticed to where it began. In some cases, this may entail manual decoding of parts of messages based on the appropriate standard to identify particular encoding errors. It may also require lab testing using the airborne equipment (and sometimes the ground networks) to reliably assign the problem to a particular cause.

D.3.3.2.4 Once the problem is identified, then the task of coordination with affected parties begins. The stakeholder who is assigned responsibility for fixing the problem must be contacted and a corrective action plan agreed. The stakeholder who initiated the problem report shall be provided with regular updates on the progress and resolution of the problem.

D.3.3.2.5 This information (the problem description, the results of the analysis and the plan for corrective action) is then entered into a database covering data link problems, both in a complete form to allow continued analysis and monitoring of the corrective action and in a de-identified form for the information of other stakeholders. These de-identified summaries are reported at the appropriate regional management forum and made available to other regional central reporting/monitoring agencies on request.

D.3.4 Mitigating procedures – problem resolution

D.3.4.1 The DL/CMRA responsibility does not end with the problem's identification and resolution. As part of that activity, and because a considerable period of time may elapse while software updates are applied to all aircraft in a fleet, procedural methods to mitigate the problem may need to be developed while the solution is being coordinated. The regional monitoring agency should identify the need for such procedures and develop recommendations for implementation by the ANSPs, CSPs and operators involved.

D.4 Regional performance monitoring

D.4.1 General

D.4.1.1 This section provides guidance on periodic reporting by individual ANSP of observed system performance in their airspace that will enable regional performance metrics to be developed for the availability, CPDLC transaction time and ADS-C surveillance data transit time requirements specified in Appendix B and Appendix C of the PBCS Manual.

D.4.1.2 These regional performance metrics should be made available to all interested stakeholders. The use of regional websites to enhance the distribution of these metrics should be considered

D.4.1.3 CPDLC analysis will be based on the measurement of actual communication performance (ACP) against required communication monitored performance (RCMP), actual communication technical performance (ACTP) against required communication technical performance (RCTP), and pilot operational response time (PORT) against RCP PORT.

D.4.1.4 ADS-C analysis will be based on the measurement of actual surveillance performance (ASP), against the required surveillance performance (RSP).

D.4.1.5 ANSP should save data in their database for the purpose of sharing CPDLC and ADS-C transaction data, and the data should be sent as a comma delimited text file. The format for each record will contain, at minimum 20 data points for CPDLC data collection and 12 data points for ADS-C data collection as per Doc 9869.

D.4.1.6 AFI DL/CMRA will set up monthly performance reporting to obtain system performance metrics. These reports will provide data on observed availability, CPDLC transaction time and ADS-C surveillance data transit time as described herein.

D.4.2 Reporting on availability

D.4.2.1 ANSP should report on CSP notified system outages and on detected outages that have not been notified as described in paragraph D.2.3.2. This is used to calculate the actual availability of service provision.

D.4.2.2 For each outage the following information should be reported:

a) Time of CSP outage notification: In YYYYMMDDHHMM format or “Not Notified” if no CSP notification received.

b) CSP Name: Name of CSP providing outage notification if applicable.

c) Type of outage: Report media affected SATCOM, VHF, HF, ALL.

d) Outage start time: In YYYYMMDDHHMM format

e) Outage end time: In YYYYMMDDHHMM format

f) Duration of Outage: In minutes.

D.4.2.3 As per Appendix B of Doc 9869 only outages greater than 10 minutes are reported. An example form is shown in *Figure D-24*.

D.4.2.4 D.4.2.5 ANSP can use graphical analysis to track availability as illustrated in *Figure D-22* and *Figure D-23*.

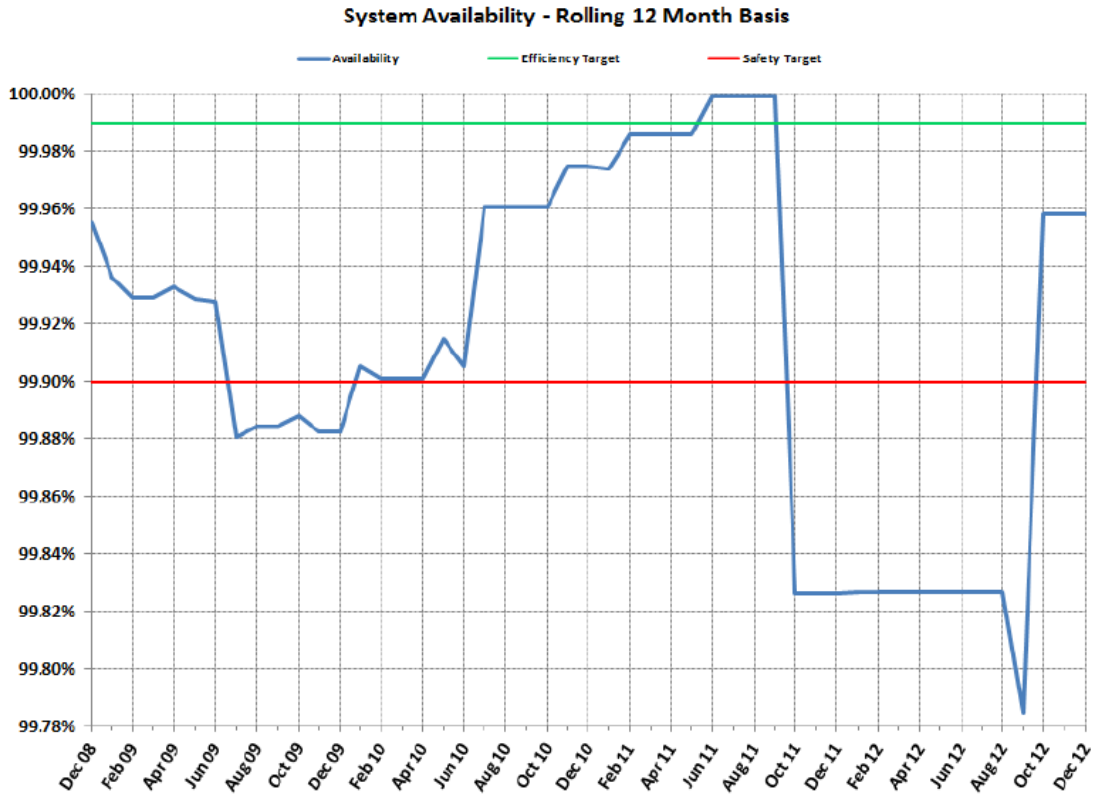


Figure D-22. Example System availability graph

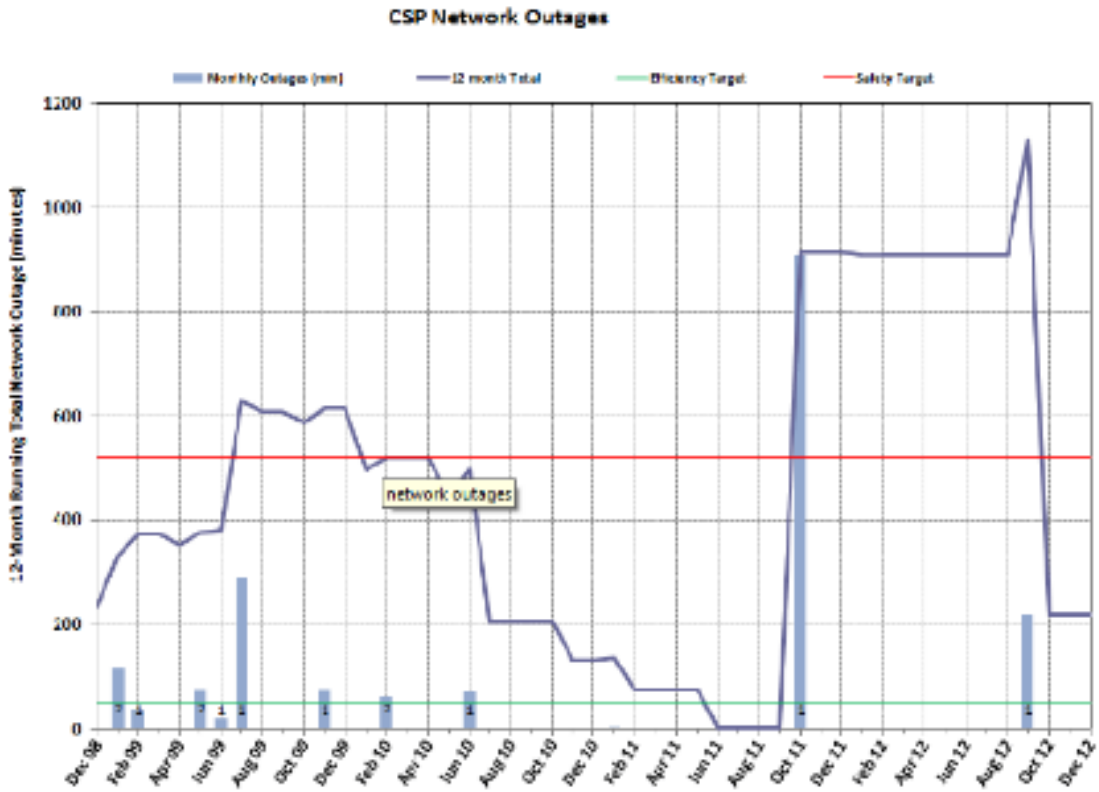


Figure D-23. Example network outage graph

D.4.3 Reporting on CPDLC actual communications performance

D.4.3.1 ANSP should report observed ACP and ACTP for RCP240 and RCP400 for different media paths using all transactions involving a WILCO response as described in paragraph D.2.1.3 of PBCS Manual. The media paths to report are:

a) From all aircraft via all remote ground station (RGS) types.

b) From all aircraft where both uplink and downlink are via SATCOM RGS

c) From all aircraft where both uplink and downlink are via VHF RGS

d) From all aircraft where both uplink and downlink are via HF RGS

e) From all aircraft where either uplink and downlink are via HF or SATCOM RGS

D.4.3.2 A tabular reporting format can be used to capture the observed performance at the 95% and 99.9% RCP240/400 times.

D.4.3.3 As PORT is independent of media path, this need only be reported for all RGS types. An example form is shown in *Figure D-24*.

D.4.4 Reporting on RSP data transit time

D.4.4.1 ANSP should report observed RSP data transit time for RSP 180 and RSP 400 and DO290/ED120 based performance specifications for different media paths as described in paragraph D.2.4. The media paths to report are:

a) From all aircraft via all Remote Ground Station (RGS) types.

b) From all aircraft where both uplink and downlink are via SATCOM RGS

c) From all aircraft where both uplink and downlink are via VDL RGS

d) From all aircraft where both uplink and downlink are via HFDL RGS

e) From all aircraft where either uplink and downlink are via HFDL or SATCOM RGS

D.4.4.2 A tabular reporting format can be used to capture the observed performance at the 95% and 99.9% RSP 180 and RSP 400 times. An example form is shown in *Figure D-24*.

Monthly Report of Datalink Performance by <ANSP Name> for <FIR Name> for <month> <year>					
Section 1: Availability					
CSP Notification	**CSP Name**	**Outage Type**	**Start**	**End**	**Duration (mins)**
No Notified	N/A	SATCOM	200907212233	200907212255	22
200907281515	SITA	SATCOM	200907281510	200907281525	15

Section 2: CPDLC					
ALL RGS			**SATCOM**		
ACTP RCP 240	**120 sec**	**98.20%**	**ACTP RCP 240**	**120 sec**	
	150 sec	**100%**		**150 sec**	
ACP RCP 240	**180 sec**	**98%**	**ACP RCP 240**	**180 sec**	
	210 sec	**97.70%**		**210 sec**	
PORT	**60 sec**	**98%**			
ACTP RCP 400	**260 sec**		**ACTP RCP 400**	**260 sec**	
	310 sec			**310 sec**	
ACP RCP 400	**320 sec**		**ACP RCP 400**	**320 sec**	
	370 sec			**370 sec**	
VDL			**HFDL**		
ACTP RCP 240	**120 sec**		**ACTP RCP 240**	**120 sec**	
	150 sec			**150 sec**	
ACP RCP 240	**180 sec**		**ACP RCP 240**	**180 sec**	
	210 sec			**210 sec**	
ACTP RCP 400	**260 sec**		**ACTP RCP 400**	**260 sec**	
	310 sec			**310 sec**	
ACP RCP 400	**320 sec**		**ACP RCP 400**	**320 sec**	
	370 sec			**370 sec**	
SATCOM + HFDL					
ACTP RCP 240	**120 sec**				
	150 sec				
ACP RCP 240	**180 sec**				
	210 sec				
ACTP RCP 400	**260 sec**				
	310 sec				
ACP RCP 400	**320 sec**				
	370 sec				

Section 3: ADS-C					
ALL RGS			**SATCOM**		
ASP RSP 180	**90 sec**	**98.20%**	**ASP RSP 180**	**90 sec**	
	180 sec	**100%**		**180 sec**	
ASP RSP 400	**300 sec**	**98%**	**ASP RSP 400**	**300 sec**	
	400 sec	**97.70%**		**400 sec**	
VDL			**HFDL**		
ASP RSP 180	**90 sec**		**ASP RSP 180**	**90 sec**	
	180 sec			**180 sec**	
ASP RSP 400	**300 sec**		**ASP RSP 400**	**300 sec**	
	400 sec			**400 sec**	
SATCOM + HFDL					
ASP RSP 180	**90 sec**				
	180 sec				
ASP RSP 400	**300 sec**				
	400 sec				

Figure D-24. Example ANSP monthly report

D.4.5 Reporting data to enable graphical reports

D.4.5.1 In addition to the tabular performance reporting described above regions should consider presenting performance data using graphical means. Performance graphs illustrating regional communications and surveillance performance for the different media paths can be readily obtained by aggregating spreadsheet data from individual ANSP as illustrated in *Figure D-25*. This figure illustrates part of an ANSP report of actual performance for ACTP, ACP, and PORT against the RCP240 requirements for a particular media type where the number of messages received within a time is recorded at one second intervals. This type of data can be included in an ANSP monthly report to enable regional aggregation of agreed performance information to allow it to be presented in graphical form. Regions could present all or some of the data reported in tabular form per paragraphs D.4.3 and D.4.4 above in graphical form if desired. This method of reporting would also assist global aggregation.

ACTP#	ACTP%	ACP#	ACP%	CREW#	CREW%	t"
0	0.00%	0	0.00%	149	0.89%	0
0	0.00%	0	0.00%	176	1.05%	1
0	0.00%	0	0.00%	210	1.26%	2
0	0.00%	0	0.00%	322	1.93%	3
0	0.00%	0	0.00%	673	4.03%	4
0	0.00%	0	0.00%	1444	8.64%	5
1	0.01%	0	0.00%	2330	13.94%	6
29	0.17%	0	0.00%	3133	18.74%	7
988	5.91%	0	0.00%	3946	23.60%	8
3939	23.56%	0	0.00%	4731	28.30%	9
6726	40.23%	0	0.00%	5667	33.90%	10
8519	50.96%	0	0.00%	6763	40.45%	11
9566	57.22%	3	0.02%	7811	46.72%	12
10585	63.31%	13	0.08%	8794	52.60%	13
11356	67.93%	33	0.20%	9594	57.39%	14
11910	71.24%	67	0.40%	10355	61.94%	15
12401	74.18%	136	0.81%	10964	65.58%	16
12962	77.53%	232	1.39%	11483	68.69%	17
13530	80.93%	609	3.64%	11899	71.17%	18
13938	83.37%	1949	11.66%	12267	73.38%	19
14247	85.22%	3280	19.62%	12595	75.34%	20
14415	86.22%	4326	25.88%	12867	76.96%	21
14586	87.25%	5362	32.07%	13145	78.63%	22
14724	88.07%	6308	37.73%	13387	80.08%	23
14839	88.76%	7057	42.21%	13588	81.28%	24
14943	89.38%	7766	46.45%	13764	82.33%	25
15029	89.90%	8388	50.17%	13930	83.32%	26
15128	90.49%	8977	53.70%	14098	84.33%	27
15220	91.04%	9494	56.79%	14249	85.23%	28
15323	91.66%	9968	59.62%	14425	86.28%	29
15402	92.13%	10373	62.05%	14562	87.10%	30
15448	92.40%	10763	64.38%	14696	87.91%	31
15501	92.72%	11102	66.41%	14826	88.68%	32
15543	92.97%	11433	68.39%	14938	89.35%	33
15599	93.31%	11720	70.10%	15049	90.02%	34
15640	93.55%	11985	71.69%	15160	90.68%	35
15683	93.81%	12235	73.18%	15258	91.27%	36
15720	94.03%	12477	74.63%	15338	91.75%	37
15747	94.19%	12703	75.98%	15405	92.15%	38
15790	94.45%	12908	77.21%	15476	92.57%	39
15813	94.59%	13111	78.42%	15533	92.91%	40
15851	94.81%	13289	79.49%	15603	93.33%	41
16660	99.65%	16540	98.94%	16655	99.62%	200
16660	99.65%	16543	98.95%	16656	99.63%	201
16662	99.67%	16547	98.98%	16656	99.63%	202
16662	99.67%	16549	98.99%	16656	99.63%	203
16662	99.67%	16549	98.99%	16656	99.63%	204
16662	99.67%	16550	99.00%	16657	99.64%	205
16662	99.67%	16553	99.01%	16657	99.64%	206
16662	99.67%	16556	99.03%	16657	99.64%	207
16662	99.67%	16561	99.06%	16657	99.64%	208
16664	99.68%	16563	99.07%	16659	99.65%	209
16664	99.68%	16564	99.08%	16662	99.67%	210
16664	99.68%	16565	99.08%	16662	99.67%	211
16664	99.68%	16566	99.09%	16662	99.67%	212
16666	99.69%	16567	99.10%	16663	99.67%	213
16667	99.69%	16571	99.12%	16663	99.67%	214
16667	99.69%	16572	99.13%	16665	99.68%	215
16667	99.69%	16574	99.14%	16665	99.68%	216
16667	99.69%	16575	99.14%	16665	99.68%	217
16667	99.69%	16576	99.15%	16666	99.69%	218
16669	99.71%	16577	99.16%	16666	99.69%	219
16669	99.71%	16579	99.17%	16666	99.69%	220
16669	99.71%	16580	99.17%	16666	99.69%	221
16672	99.72%	16581	99.18%	16666	99.69%	222
16673	99.73%	16583	99.19%	16666	99.69%	223
16674	99.74%	16586	99.21%	16666	99.69%	224
16675	99.74%	16586	99.21%	16667	99.69%	225
16675	99.74%	16589	99.23%	16667	99.69%	226
16675	99.74%	16589	99.23%	16667	99.69%	227
16676	99.75%	16593	99.25%	16668	99.70%	228
16677	99.75%	16594	99.26%	16668	99.70%	229
16677	99.75%	16596	99.27%	16668	99.70%	230
16677	99.75%	16597	99.28%	16668	99.70%	231
16677	99.75%	16598	99.28%	16668	99.70%	232
16677	99.75%	16601	99.30%	16668	99.70%	233
16677	99.75%	16604	99.32%	16668	99.70%	234
16678	99.76%	16604	99.32%	16668	99.70%	235
16678	99.76%	16605	99.32%	16668	99.70%	236
16679	99.77%	16606	99.33%	16668	99.70%	237
16679	99.77%	16607	99.34%	16668	99.70%	238
16680	99.77%	16609	99.35%	16668	99.70%	239
16681	99.78%	16609	99.35%	16668	99.70%	240
37	0.22%	109	0.65%	50	0.30%	>240
16718	100.00%	16718	100.00%	16718	100.00%	Total

Figure D-25 Example ANSP monthly report that will enable graphical analysis

D.4.5.2 AFI DL/CMRA shall takes into account other monitoring programme in the Region particularly those established such as for monitoring RVSM, performance-based horizontal separation minima, and safety of ATM operations such as ARMA, SATMA.

D.4.5.3 AFI DL/CMRA should provide a forum for users to develop and share tools to facilitate the conduct of specific analysis on selected data or to automatically query a database and send non-compliance and corrective action notices to appropriate parties.

D.4.5.4 AFI DL/CMRA programme should provide staff support to assist ANSPs and other participants to investigate problems and conduct local and regional analyses.

D.4.5.5 AFI DL/CMRA should support participating ANSPs in the analysis and reporting of operational data, including ACP, ASP and availability data, at the regional level, including:

a) coordinate, as requested by the participating ANSPs, the analysis of degraded performance and availability issues that are common within the region or globally; and

b) produce regional PBCS monitoring reports in accordance with established procedures for receiving ANSP-monitored information and report formats provided by the participating ANSPs;

D.4.5.6 AFI DL/CMRA should notify appropriate parties when the operational system does not meet the RCP/RSP specification, including:

a) the relevant ANSP when the non-compliance concerns a subsystem of the infrastructure, including the CSP/SSP, under its control; and

b) the relevant operator and the State of the Operator or State of Registry when the non-compliance concerns the operator, or any aircraft type or individual aircraft within its fleet.

Note.— Typically, means to notify the State of the Operator or State of Registry will be conducted via the regional PBCS monitoring programme to which the relevant State is assigned. If the relevant State is not assigned to a regional PBCS monitoring programme, then the regional PBCS monitoring programme that originated the non-compliance action would contact the State directly.

D.4.5.7 AFI DL/CMRA should coordinate the global exchange of monitoring information in accordance with the guidelines provided in section 5.5.4 of the PBCS Manual.

D.4.5.8 AFI DL/CMRA should exchange the following information with Data Link monitoring programmes in other regions:

a) lessons learned from PBCS implementation and operations;

b) analytical tools that can be shared for conducting analysis of ACP and ASP;

c) a list of aircraft operators that are filing RCP/RSP designators in their flight plan; and

d) a list of known problems, including those with particular networks, components of a network, aircraft types/systems, or aircraft operators, and associated resolutions.