



International Civil Aviation Organization

The Second Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/2)

Bangkok, Thailand, 4-8 October 2004

Agenda Item 6: Airspace safety monitoring documentation and regional guidance material

**Quarterly Safety Monitoring Reports from the
Pacific Approvals Registry and Monitoring Organization**

Presented by the Pacific Approvals Registry and Monitoring Organization (PARMO)

SUMMARY

This information paper presents the latest quarterly safety monitoring report from the Pacific Approvals Registry and Monitoring Organization (PARMO). The purpose of the safety monitoring report is to compare actual performance to safety goals related to the Reduced Vertical Separation Minimum (RVSM) implementation in Pacific airspace. As the regional monitoring agency (RMA) for Pacific airspace, the PARMO is responsible for circulating regular reports of all reported height-keeping deviations, together with the necessary information to relate the estimated system risk to the target level of safety (TLS). In fulfilment of this responsibility, the PARMO produces safety monitoring reports quarterly. This report contains a summary of large height deviation reports received by the PARMO for the period April – June 2004.

1. Introduction

- 1.1. The Pacific Approvals Registry and Monitoring Organization (PARMO) has developed a report which is distributed on a quarterly basis to Pacific air traffic service (ATS) providers and airspace users. The First Meeting of the Regional Airspace Safety Monitoring Advisory Group considered the first of these reports, covering calendar year 2003 (reference). The report presented as an attachment to this paper is considered to be in harmony with the International Civil Aviation Organization's (ICAO) emphasis on safety management systems.

2. Discussion

- 2.1. This information paper provides as an attachment the most recent of the PARMO safety monitoring reports. Each such report contains a summary of large height deviation reports received for the most recent three-month period.
- 2.2. Future reports will contain additional information relative to system safety such as the annual "approval status" check on the airspace. As noted in the reference, the PARMO is developing procedures to examine lateral navigational performance of aircraft using radar data, with application to the start or end of oceanic routes where the RNP-10 is applied in the Oakland FIR. The intention is to eventually expand the area in which navigational performance is evaluated to all areas of Pacific oceanic airspace where RNP-10 is applied. This additional feature of the report has been slowed due to Technical Center emphasis on safety-related aspects of the planned January 2005 implementation of RVSM in North America. Ultimately, the report will include periodic examinations of core navigational performance that will ensure the basic RNP-10 requirements are being met.

3. Recommendation

3.1. The meeting is invited to note the information presented in this paper.

4. Reference

“Quarterly Safety Monitoring Reports From the Pacific Approvals Registry and Monitoring Organization,” First Meeting of the Regional Airspace Monitoring Advisory Group (RASMAG/1), Bangkok, Thailand, 26 – 30, 2004.

Attachment 1 - Pacific Airspace RVSM Safety Monitoring Report: April – June 2004



**Pacific Airspace
RVSM Safety Monitoring Report
April – June 2004**

Prepared by:
Pacific Approvals Registry and Monitoring Organization (PARMO)

Summary

The purpose of this quarterly report is to compare actual performance to safety goals related to the reduced vertical separation minimum (RVSM) implementation in Pacific airspace. As the regional monitoring agency (RMA) for Pacific airspace, the Pacific Approvals Registry and Monitoring Organization (PARMO) is responsible for circulating regular reports of all reported height-keeping deviations, together with the necessary information to relate the estimated system risk to the target level of safety (TLS). In fulfillment of this responsibility, the PARMO distributes this report on a quarterly basis.

This report contains a summary of large height deviation reports received by the PARMO for the most recent 12-month period of May 2003 – June 2004. There are a total of eleven reported large height deviations that occurred during this 12-month period inside Pacific airspace which is restricted to aircraft operating using RVSM.

1. Introduction

- 1.1. The Pacific Approvals Registry and Monitoring Organization (PARMO), a service provided by the U.S. Federal Aviation Administration's Technical Center, serves as the regional monitoring agency (RMA) for Pacific airspace.
- 1.2. The first safety monitoring report for Pacific airspace for the period October – December 2003 was distributed in January 2004 (reference 1). Reference 1 presented a summary of large height deviation reports received by the PARMO for the year 2003. In addition, an update of the vertical collision risk for Pacific airspace was presented. The vertical collision risk estimate for this period was roughly a factor of 30 below the TLS of 5.0×10^{-9} fatal accidents per flight hour. However, this estimate was based on a composite of old parameters combined with recent traffic counts and is not representative of a complete calendar year of large height deviation reporting.

- 1.3. The second safety monitoring report for Pacific airspace for the period January – March 2004 (reference 2) contained an update to the summary of large height deviation reports.
- 1.4. This report contains an update to the large height deviations reports received by the PARMO. Later this calendar year, the PARMO will provide an update to the vertical collision risk estimate using the requested April 2004 traffic movement samples from the various Pacific flight information regions (FIRs).

2. Data Sources

- 2.1. Monthly large height deviation reports are forwarded to the PARMO from the Pacific air traffic service (ATS) providers/FIRs. The ATS providers have the surveillance information available in the form of voice or automatic dependent surveillance (ADS) reports and, where available, secondary surveillance radar Mode C returns. These data are used to support the estimation of risk for the airspace.
- 2.2. The FAA's National Airspace Incident Monitoring System (NAIMS) provide access to several principal aviation safety data and information sources. The PARMO scans this database periodically in search of incidents occurring in Pacific airspace. These data supplement the large height deviation reports received.
- 2.3. Additional reports of large height deviations are occasionally received from various operators. The PARMO reviews these reports and includes them, as appropriate, with the reports received from the ATS providers in estimating the overall risk for the airspace.

3. Large Height Deviations Report Summary

- 3.1. Appendix A of this report contains the status of large height deviation reporting to the PARMO for the period April – June 2004. This table presents a list of the FIRs in Pacific airspace that provided the PARMO with large height deviation reports each month, including 'NIL reports'.
- 3.2. As shown in Appendix A, the large height deviation reporting has improved since the previous safety monitoring reports (references 1 and 2). ATS providers should continue to forward the reports of large height deviations of 300 ft or more to the PARMO on a monthly basis. The email address for the PARMO is: aparmo@faa.gov. The website address for the PARMO is <http://www.tc.faa.gov/acb300/PARMO/>.
- 3.3. The large height deviation reports are separated by categories based on the details provided for each deviation. There are three categories created for this report, they are; risk-bearing large height deviations not involving whole numbers of flight levels, risk-bearing large height deviations involving whole numbers of flight levels, and large height deviations occurring outside of restricted RVSM airspace in the Pacific.

- 3.4. Appendix B contains the details of all risk-bearing large height deviations not involving whole numbers of flight levels reported to the PARMO during the period July 2003 – June 2004. There are two such large height deviations. The cause of the first deviation listed in the table was reported to be turbulence or another weather-related cause. The cause of the second deviation listed was a TCAS resolution advisory. The duration spent at the large vertical deviation was not provided in either report.
- 3.5. Details of all risk bearing large height deviations involving whole numbers of flight levels reported to the PARMO during the period July 2003 – June 2004 are contained in Appendix C. There are nine such large height deviations.
 - 3.5.1. The cause of five of the errors listed in Appendix C is reported to be an error in the air traffic control (ATC)-unit-to-ATC-unit transition message. The time spent at an incorrect flight level was not reported for all of these errors. The PARMO assumes a 5-minute duration for this error type if duration is not provided in the report.
 - 3.5.2. Two of the errors listed in Appendix C were reported caused by an aircraft climb without ATC clearance. The report dated 31 October 2003 involved another aircraft but the time spent at incorrect flight level was not provided. The other reported incident caused by an aircraft climb without ATC clearance took place in Pacific RVSM airspace however, it occurred in a portion of the reporting FIR's airspace which is far removed from the volume of airspace where significant traffic density exists. The time spent at an incorrect flight level for the third vertical deviation listed in Appendix C was estimated to be less than 17 minutes.
 - 3.5.3. There was one reported error caused by a negative transfer received from ATC transitioning unit. The time spent at incorrect flight level was not provided in the report but was estimated by the PARMO to be less than 5 minutes. Another reported incident was caused by an ATC clearance resulting in a loss of vertical and longitudinal separation with other traffic. There were a total of 4 aircraft involved in this incident; the estimated duration of the error is 19 minutes.
- 3.6. Appendix D contains the details of all reported large height deviations occurring outside of restricted Pacific RVSM airspace during the period July 2003 – June 2004. These large height deviations do not affect the risk estimate for Pacific airspace but are presented in this report for completeness. There are two such large height deviations. The first deviation listed in Appendix D is excluded from the estimate of risk because the reported flight levels are below the vertical limits of restricted Pacific RVSM airspace, that is, below FL290. The second deviation listed is excluded from the estimate of risk because the flight involved is operating in the domestic portion of Australian airspace.

4. Summary and Conclusions

- 4.1. This report has presented a summary of large height deviation reports received by the PARMO for the period July 2003 through June 2004.
- 4.2. There were eleven reported large height deviations that occurred inside Pacific airspace which is restricted to aircraft operating using RVSM. One of the

deviations was caused by turbulence or some other weather related cause. A TCAS Resolution Advisory caused another deviation.

- 4.3. There were five reported deviations caused by an error in the ATC-unit-to-ATC-unit transition message, the times spent at an incorrect flight level were either provided or estimated by the PARMO. There were two reported large height deviations that occurred due to an aircraft climb without ATC clearance. One of these reports involved another aircraft but the time spent at incorrect flight level was not provided. The other reported incident caused by an aircraft climb without ATC clearance took place in Pacific RVSM airspace however, the operation involved took place in Pacific RVSM airspace however, it occurred in a portion of the reporting FIR's airspace which is far removed from the volume of airspace where significant traffic density exists. The reported time spent at an incorrect flight level was not greater than 17 minutes.
- 4.4. There was one reported error caused by a negative transfer received from ATC transitioning unit. The time spent at incorrect flight level was not provided in the report. Another reported incident was caused by an ATC clearance resulting in a loss of vertical and longitudinal separation with other traffic. There were a total of 4 aircraft involved in this incident; the estimated duration of the error is 19 minutes.
- 4.5. ATS providers should continue to forward the reports of large height deviations of 300 ft or more to the PARMO on a monthly basis. A 'NIL report' (where applicable) is as valuable as a report containing actual incidents. Therefore, if zero events occur during a calendar month, it is still necessary to submit a 'NIL report' to the PARMO. The email address for the PARMO is: aparmo@faa.gov. The website address for the PARMO is <http://www.tc.faa.gov/acb300/PARMO/>.

References

1. "Pacific Airspace RVSM Safety Monitoring Report October – December 2003", Draft Version 1.0, Prepared by the PARMO, January 2004.
2. "Pacific Airspace RVSM Safety Monitoring Report January – March 2004", Draft Version 1.0, Prepared by the PARMO, April 2004.

Appendix A
Monthly Large Height Deviations Reports Received by the PARMO

STATE	AUSTRALIA	FIJI	JAPAN		NEW ZEALAND	TAHITI	UNITED STATES		PAPA NEW GUINEA
FIR	<i>Brisbane</i>	<i>Nadi</i>	<i>Naha</i>	<i>Tokyo</i>	<i>Auckland</i>	<i>Tahiti</i>	<i>Anchorage</i>	<i>Oakland</i>	<i>Port Moresby</i>
Jul-03			X	X					
Aug-03			X	X	X				
Sep-03			X	X	X				
Oct-03	X		X	X	X			X	
Nov-03	X		X	X	X	X		X	
Dec-03	X		X	X	X	X		X	
Jan-04	X		X	X	X			X	
Feb-04	X		X	X	X		X	X	
Mar-04	X				X		X	X	
Apr-04	X		X	X	X			X	
May-04			X	X	X		X		
Jun-04*			X	X	X				

X = Large Height Deviation has been received for the specified month (including reports indicating "NIL" events)

* March 2004 Large Height Deviation Reports are due by 30 April 2004

Appendix B

**Risk-Bearing Height Deviation Incidents Not Involving Whole Numbers of Flight Levels between FL290 and FL390 in Pacific
Airspace Reported to the PARMO from July 2003 – June 2004**

Event date	Source	Location of deviation	AC Type	Time	Assigned FLVL	Observed / Reported FLVL	Duration at incorrect FLVL	Cause	Other traffic
22 Nov 2003	ZOA	R576 / DEROK	B764	0311	360	363		Deviation due to turbulence or other weather related cause	
24 Dec 2003	NAIMS	ZAN airspace			360	360		TCAS RA – aircraft above at FL370 had auto pilot turned off and began a descent causing TCAS RA	1

Appendix C
Risk-Bearing Height Deviation Incidents Involving Whole Numbers of Flight Levels between FL290 and FL390 in Pacific
Airspace Reported to the PARMO from July 2003 – June 2004

Event date	Source	Location of deviation	AC Type	Time	Assigned FLVL	Observed / Reported FLVL	Duration at incorrect FLVL	Cause	Other traffic
24 Jul 2003	NAIMS	ELLMAS / G457	B763	2348	340	340	< 5 minutes	Negative transfer received from ATC transitioning unit	Nil
31 Oct 2003	NAIMS	OMOTO / R580		0602	340	360	< 5 minutes	Error in ATC-unit-to-ATC-unit message	Nil
26 Nov 2003	NAIMS	R577 / near ERWEN			380	390		Climb without ATC clearance – caused longitudinal separation loss with other traffic	1
28 Aug 2003	Airways NZ	RIGMI /A464 / SOPAC	B767	1958	350	370	4 minutes	Error in ATC-unit-to-ATC-unit message	Nil
1 Dec 2003	NAIMS	NIPPI / R220			390	410	< 5 minutes	Error in ATC-unit-to-ATC-unit message	Nil
17 Jan 2004	Airways NZ	SOSPI	A340	1932	360	380	5 minutes	Error in ATC-unit-to-ATC-unit message	Nil
29 Jan 2004	NAIMS	R465 / CITTA	B772	1844	390	390	19 minutes	ATC clearance resulting in a loss of vertical and longitudinal separation with other traffic	3
4 Feb 2004	Airways NZ	5613S 142W		0855	350	360	< 17 minutes	Aircraft climb without ATC clearance	Nil

Event date	Source	Location of deviation	AC Type	Time	Assigned FLVL	Observed / Reported FLVL	Duration at incorrect FLVL	Cause	Other traffic
12 Feb 2004	NAIMS	12N 130E	B728	0425	340	360	< 5 minutes	Error in ATC-unit-to-ATC-unit message	Nil

Appendix D
Height Deviation Incidents Occurring Outside of Restricted Pacific RVSM Airspace from July 2003 – June 2004

Event date	Source	Location of deviation	AC Type	Time	Assigned FLVL	Observed / Reported FLVL	Duration at incorrect FLVL	Cause	Other traffic
8 Dec 2003	ZOA	ZIBUD ZEFER HEMLO ONP / PGUA - KRCA	B1/I	1949	210	250		Deviation due to turbulence or other weather related cause	
27 June 2004	Qantas	Enroute BNE-CNS	B738		320	323		Actions taken due to mechanical or equipment problems	Nil