



IBAC Bulletin B00-2

Subject: Pacific Implementation of RVSM and RNP –10/50NM Lateral

Previous notification had been made regarding implementation of RVSM and RNP in the Pacific Region. This Bulletin provides confirmation of the intent to implement as advised in international notams. Original material in this Bulletin was provided to IBAC by Roy Grimes of the FAA (AFS-400).

The Pacific RVSM Task Force met in Honolulu from 20-22 Jan. The decision was made to implement:

A. RVSM. On 24 Feb 2000 at 0700 UTC, RVSM will be implemented in the Anchorage, Oakland Oceanic, Auckland, Brisbane, Nadi, Naha, Tahiti, and Tokyo FIR's between FL 290-390 (inclusive). In the Port Moresby FIR, RVSM will be between FL 310-390.

B. CEP RNP-10/50NM-LATERAL. On 24 Feb 2000 at 0700 UTC, 50nm-lateral separation requiring RNP-10 approval will be implemented on the CEP (Central East Pacific (CEP), Hawaii) Track System also between FL 290-390 (inclusive).

Updated copies of documents that had previously been made available by the FAA are attached. The updates are EDITORIAL in nature. The Documents are:

A. PACIFIC RVSM OPERATIONAL POLICY REVISIONS: EXPLANATION OF FAA NOTAM AND PACIFIC AIP'S (AERONAUTICAL INFO PUBLICATIONS).

B. OPERATOR CHECKLIST FOR A NEW RVSM AREA OF OPERATIONS.

JEPP AERONAUTICAL CHART PANELS. The information in the NOTAM has been coordinated with Jeppesen specialists and should appear on the appropriate Pacific H/L charts prior to 24 Feb.

FAA RNP & RVSM WEBSITES. The Quick Jump Menu has been eliminated from the FAA website. (It was thought that it was overloaded). For current info on the RNP-10 and RVSM aircraft/operator approval programs, please use:

A. RVSM: www.faa.gov/ats/ato/rvsm1.htm

B. RNP-10/50nm-lateral separation: www.faa.gov/ats/ato/rnp.htm

REQUEST FOR MAXIMUM DISTRIBUTION. If you have not already done so, please ensure that this information gets the widest possible distribution in your organization.

Attachment A

PacPol5.doc
Dec 2000

Rev 3: 5

PACIFIC RVSM: OPERATIONAL POLICY/PROCEDURES

FAA NOTAM AND STATE AIP'S (AERONAUTICAL INFORMATION PUBLICATIONS)

1. **PURPOSE.** It is the objective of this paper to highlight specific operational policy/procedures for Pacific Reduced Vertical Separation Minimum (RVSM) operations that have been revised or updated for Pacific RVSM implementation.

2. **REVISION 3 CHANGES.** Wording that has been revised from Revision 2 is shown in this document in **Bold and Italics**.

a. **PARAGRAPH 7.7, 7.8 AND 7.9 PILOT ACTIONS.** These paragraphs have been updated to reflect the current guidance for pilot actions when deviating to avoid convective weather. There is a significant change to the Climb/Descent table that follows Paragraph 7.9 f. It now calls for the pilot, when deviating without a clearance, to make a 300 ft climb or descent based on direction of flight and direction of deviation. This provision provides contingency vertical separation to supplement lateral separation between aircraft in all the common weather deviation scenarios. Contingency vertical separation between aircraft will be 400-2,000 ft depending on the scenario. A note below the table ties it to the other pilot actions called for to mitigate conflict between aircraft.

b. **PARAGRAPH 8.0 OFFSET PROCEDURES.** This paragraph has been re-titled and revised to reflect that the pilot may wish to offset to avoid distracting nuisance alerts received from aircraft systems such as ACAS.

3. **REFERENCES.**

a. **FAA INTERNATIONAL NOTICE TO AIRMEN (NOTAM):** The first version of this NOTAM is published in the FAA Domestic/International NOTAM book. A copy of the revised NOTAM that will be published in the December 28 edition of the FAA Domestic/International NOTAMS is attached to this checklist. We have highlighted information contained in the NOTAM that has been revised for Pacific operations.

b. **PACIFIC AIR TRAFFIC SERVICES PROVIDER (ATSP) AERONAUTICAL INFORMATION PUBLICATIONS (AIPs) RELATED TO PACIFIC RVSM.** The NOTAM information discussed above was developed by the International Civil Aviation Organization (ICAO) Asia/Pacific RVSM Task Force. Individual Pacific ATSP AIP's will contain common policy/procedures with certain possible exceptions. **Exceptions may be:**

(1) **PARAGRAPH 2.0 (APPLICATION OF RVSM AIRSPACE).** The Pacific ATSPs are implementing RVSM in their flight information regions (FIRs) between flight level (FL) 290-390 (inclusive). However, operators should review the individual State AIPs for specific airspace policy related to RVSM requirements. In the Naha FIR, for example, for a period of time, aircraft not approved for RVSM will be allowed to file and fly between FL's 290-390 with 2,000 ft vertical separation applied.

(2) PARAGRAPH 9.0 (TRANSITION AREAS)

(3) PARAGRAPH 10.0 (FLIGHT PLANNING).

(4) PARAGRAPH 11.0 (STATE AIRCRAFT)

(5) PARAGRAPH 12.0 (OPERATION OF NON-RVSM AIRCRAFT WITHIN RVSM AIRSPACE).

4. SIGNIFICANT RVSM PILOT PROCEDURES PUBLISHED IN NOTAM/STATE AIP'S: ADOPTED BY ALL PACIFIC ATSP.

a. **PILOT LEVEL CALL (PARAGRAPH 4.4).** Except when under radar or Automatic Dependent Surveillance (ADS), Pacific ATSPs are requiring pilots to report leveling at an assigned FL. This is intended to provide the controller the opportunity to catch incidents where the aircraft levels at a FL other than that assigned. SAMPLE PHRASEOLOGY: "Atlas 123 level FL 350".

b. **SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES (PARAGRAPH 5.0) AND SUBSONIC AIRCRAFT REQUIRING RAPID DESCENT, TURN-BACK OR DIVERSION (PARAGRAPH 6.0).** These paragraphs have been updated for RVSM operations.

c. **WEATHER DEVIATION PROCEDURES (PARAGRAPH 7.0).** The weather deviation procedures have been updated as noted in paragraph 2.

d. **OFFSET PROCEDURES (PARAGRAPH 8.0).** The Pacific ATSPs have adopted the procedures established in the North Atlantic to enable the pilot to offset up to 2 NM to avoid encounters with wake turbulence.

ATTACHMENT

APPLICABILITY. *The FAA NOTAM addressing RVSM implementation that was effective 24 February 2000 will be revised, as noted in paragraph 2 above, in the 28 December edition of FAA NOTICES TO AIRMEN (Domestic/International). The NOTAM can be found in*

Part 3 (International NOTAMS) in the International Oceanic Airspace Notices section.

Oakland and Anchorage Oceanic FIR's RVSM implementation

1.0 Introduction

1.1 The International Civil Aviation Organization (ICAO) Third Asia/ Pacific Regional Air Navigation meeting recommended that Reduced Vertical Separation Minimum (RVSM) should be introduced in the Pacific region after successful implementation in the North Atlantic region. This is also due to the significant benefits to be gained by aircraft operators and air traffic services (ATS) providers. ICAO Document 9574, *Manual on Implementation of a 300 m [1 000*

fi] Vertical Separation Minimum Between FL 290 and FL 410 Inclusive contains an explanation of RVSM.

- 1.2 Benefits to be gained from RVSM include:
- (a) adoption of an ICAO endorsed navigation requirement;
 - (b) improved utilization of airspace for ATC conflict resolution; and
 - (c) fuel savings of $\approx 1\%$ for flight closer to optimum cruise altitude.

2.0 Application of RVSM airspace

2.1. Australia, Fiji, New Zealand, Tahiti, the United States, Japan, and Papua New Guinea will simultaneously implement RVSM within specified areas of their Flight Information Regions (FIR).

2.2 Effective 0700, 24 February 2000 UTC, RVSM airspace is prescribed within the Oakland Oceanic FIR and Anchorage Oceanic FIR within controlled airspace between FL 290 and FL 390 inclusive. The flight level orientation scheme (FLOS) is single alternate, per ICAO Annex 2, Appendix 3a.

Note: Oakland and Anchorage Oceanic Centers will publish separate NOTAMS showing the FLOS for the Central East Pacific (CEP) and North Pacific (NOPAC) Route Systems.

3.0 Airworthiness and Operational Approval and Monitoring

3.1 Operators must obtain operational approval from the State of Registry or State of the Operator, as appropriate, to conduct RVSM operations. On behalf of the Pacific Air Traffic Service Providers, the FAA is maintaining a website containing documents and policy for RVSM approval. Address is: www.faa.gov/ats/ato/rvsm1.htm. In the Pacific RVSM Documentation section, "Documents and Process for Pacific RVSM Aircraft and Operator Approval" provides an outline of approval process events with references to related documents.

3.2 If TCAS is installed in RVSM compliant aircraft, the equipment should be updated to Change 7, or a later approved version, for optimum performance in RVSM airspace.

3.3 An essential part of the implementation of RVSM is the ability to monitor aircraft height to ensure that the aircraft height-keeping performance standard is being met. The Asia Pacific Approvals Registry and Monitoring Organization (APARMO) will process the results of monitoring. For further information on RVSM monitoring the APARMO web site is:

http://www.tc.faa.gov/act500/rvsm/aparmo_intro.html

4.0 In-flight procedures within RVSM airspace

4.1 Before entering RVSM airspace, the pilot should review the status of required equipment. (See Appendix 4 of FAA Interim Guidance 91-RVSM for pilot RVSM procedures). The following equipment should be operating normally:

- (a) two primary altimetry systems:
- (b) one automatic altitude-keeping device; and
- (c) one altitude-alerting device.

4.2 The pilot must notify ATC whenever the aircraft:

- (a) is no longer RVSM compliant due to equipment failure; or
- (b) experiences loss of redundancy of altimetry systems; or
- (c) encounters turbulence that affects the capability to maintain flight level.

(See Appendix 5 of FAA Interim Guidance 91-RVSM for pilot and controller actions in such contingencies).

4.3 During cleared transition between levels, the aircraft should not overshoot or undershoot the assigned FL by more than 150 ft (45 m).

4.4 **PILOT LEVEL CALL.** Except in an ADS or radar environment, pilots shall report reaching any altitude assigned within RVSM airspace.

5.0 Special Procedures for In-flight Contingencies.

General procedures

5.1 Paragraphs 5.0, 6.0, 7.0 and 8.0 below contain procedures for in-flight contingencies that have been updated for RVSM operations.

5.2 The following general procedures apply to both subsonic and supersonic aircraft and are intended as guidance only. Although all possible contingencies cannot be covered, they provide for cases of inability to maintain assigned level due to:

- (a) weather;
- (b) aircraft performance;
- (c) pressurization failure; and
- (d) problems associated with high-level supersonic flight.

5.3 The procedures are applicable primarily when rapid descent and/or turn-back or diversion to an alternate airport is required. The pilot's judgment shall determine the sequence of actions to be taken, taking into account specific circumstances.

5.4 If an aircraft is unable to continue flight in accordance with its air traffic control clearance, a revised clearance shall, whenever possible, be obtained prior to initiating any action, using a distress or urgency signal as appropriate.

5.5 If prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time and, **until a revised clearance is received, the pilot shall:**

- (a) **broadcast**, at suitable intervals, flight identification, flight level, aircraft position, (including the ATS route designator or the track code, as appropriate) and intentions on the frequency in use, as well as on frequency 121.5 MHz (or, as a back-up, the VHF inter-pilot air-to-air frequency);
- (b) **watch** for conflicting traffic both visually and by reference to TCAS/ACAS (if equipped); and
- (c) **turn on** aircraft exterior lights.

6.0 Subsonic aircraft requiring rapid descent, turn-back or diversion

Initial action

6.1 If unable to comply with the provisions of paragraph 5.3 to obtain a revised ATC clearance, the aircraft should leave its assigned route or track by turning 90 degrees right or left whenever this is possible. The direction of the turn should be determined by the position of the aircraft relative to any organized route or track system (for example, whether the aircraft is outside,

at the edge of, or within the system). Other factors to consider are terrain clearance and the levels allocated to adjacent routes or tracks.

Subsequent action

6.2 AIRCRAFT ABLE TO MAINTAIN LEVEL. An aircraft able to maintain its assigned level should acquire and maintain in either direction a track laterally separated by 25 NM from its assigned route or track and once established on the offset track, climb or descend 500 ft (150 m).

6.3 AIRCRAFT UNABLE TO MAINTAIN LEVEL. An aircraft NOT able to maintain its assigned level should, whenever possible, minimize its rate of descent while turning to acquire and maintain in either direction a track laterally separated by 25 NM from its assigned route or track. For subsequent level flight, a level should be selected which differs by 500 ft (150 m) from those normally used.

6.4 DIVERSION ACROSS THE FLOW OF ADJACENT TRAFFIC. Before commencing a diversion across the flow of adjacent traffic, the aircraft should, while maintaining the 25 NM offset, expedite climb above or descent below levels where the majority of Pacific oceanic traffic operate (for example, to a level above FL400 or below FL290) and then maintain a level which differs by 500 ft (150 m) from those normally used. However, if the pilot is unable or unwilling to carry out a major climb or descent, the aircraft should be flown at a level 500 ft above or below levels normally used until a new ATC clearance is obtained.

6.5 ETOPS AIRCRAFT. If these contingency procedures are employed by a twin engine aircraft as a result of an engine shutdown or a failure of an ETOPS critical system, the pilot should advise ATC as soon as practicable of the situation, reminding ATC of the type of aircraft involved and requesting expeditious handling.

7.0 Weather deviation procedures

General procedures

7.1 The following procedures are intended to provide guidance. All possible circumstances cannot be covered. The pilot's judgment shall ultimately determine the sequence of actions taken and ATC shall render all possible assistance.

7.2 If the aircraft is required to deviate from track to avoid weather and prior clearance cannot be obtained, an air traffic control clearance shall be obtained at the earliest possible time. In the meantime, the aircraft shall follow the procedures detailed in paragraph 7.8 below.

7.3 The pilot shall advise ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to the centerline of its cleared route.

Obtaining ATC priority

7.4 When the pilot initiates communications with ATC, rapid response may be obtained by stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency and for ATC response.

7.5 The pilot still retains the option of initiating the communications using the urgency call "PAN PAN PAN" to alert all listening parties to a special handling condition which may receive ATC priority for issuance of a clearance or assistance.

7.6 When controller-pilot communications are established, the pilot shall notify ATC and request clearance to deviate from track, advising, when possible, the extent of the deviation expected. ATC will take one of the following actions:

- (a) if there is no conflicting traffic in the horizontal dimension, ATC will issue clearance to deviate from track; or
- (b) if there is conflicting traffic in the horizontal dimension, ATC will separate aircraft by establishing vertical separation or, if unable to establish vertical separation, ATC shall:
 - i) advise the pilot that standard separation cannot be applied;
 - ii) provide essential traffic information for all affected aircraft; and
 - iii) if possible, suggest a course of action. ATC may suggest that the pilot:
 - if operating in an airspace where a 2,000 ft vertical separation minimum is applied, climb or descend 1,000 ft from the assigned level;
 - if operating in an airspace where a 1,000 ft vertical separation minimum is applied, climb or descend 500 ft from the assigned level; or
 - if operating in an airspace where composite separation is applied, remain at the assigned level.
 - if operating in the Central East Pacific (CEP), remain at the assigned level.

7.7 The pilot will take the following actions:

- (a) ***Advise ATC of intentions by the most expeditious means available.***
- (b) ***Comply with air traffic control clearance issued or...***

(c) *Execute the procedures detailed in 7.9 below. (ATC will issue essential traffic information to all affected aircraft).*

(d) *If necessary, establish voice communications with ATC to expedite dialogue on the situation*

Actions to be taken if a revised air traffic control clearance cannot be obtained

7.8 *The pilot shall take the actions listed below under the provision that the pilot may deviate from rules of the air (e.g., the requirement to operate on route or track centre line unless otherwise directed by ATC), when it is absolutely necessary in the interests of safety to do so.*

7.9 *If a revised air traffic control clearance cannot be obtained and deviation from track is required to avoid weather, the pilot shall take the following actions:*

- a) if possible, deviate away from an organized track or route system;
- b) *establish communication with and alert nearby aircraft by broadcasting, at suitable intervals: flight identification, flight level, aircraft position (including the ATS route designator or the track code) and intentions (including the magnitude of the deviation expected) on the frequency in use, as well as on frequency 121.5 MHz (or, as a back-up, the VHF inter-pilot air-to-air frequency 123.45).*
- c) watch for conflicting traffic both visually and by reference to ACAS (if equipped);
- d) turn on *all* aircraft exterior lights (*commensurate with appropriate operating limitations*);
- e) for deviations of less than 10 NM, aircraft should remain at the level assigned by ATC;
- f) *for deviations of greater than 10NM*, when the aircraft is approximately 10 NM from track, initiate a level change based on the following criteria:

Route centre line track	Deviations >10 NM	Level change
EAST	LEFT	DESCEND 300 ft
000-179 magnetic	RIGHT	CLIMB 300 ft
WEST	LEFT	CLIMB 300 ft
180-359 magnetic	RIGHT	DESCEND 300 ft

Note: 7.9 b) c) above call for the pilot to: *broadcast aircraft position and pilot's intentions, identify conflicting traffic and communicate air-to-air with*

near-by aircraft. If the pilot determines that there is another aircraft at or near the same FL with which his aircraft might conflict, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict..

g) if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

h) when returning to track, be at its assigned flight level, when the aircraft is within approximately 10 NM of centre line.

8.0 Special procedures to mitigate wake turbulence encounters and distracting aircraft system alerts

8.1 The following special procedures are applicable to mitigate wake turbulence or distracting aircraft system alerts (e.g., ACAS, Ground Proximity Warning System (GPWS)) in Asia and Pacific airspace where RVSM is applied:

NOTE: in the contingency circumstances below, ATC will not issue clearances for lateral offsets and will not normally respond to actions taken by the pilots.

8.2 An aircraft that encounters wake vortex turbulence or experiences distracting aircraft system alerts shall notify ATC and request a flight level, track or speed change to avoid the condition. However, in situations where such a change is not possible or practicable, the pilot may initiate the following temporary lateral offset procedure with the intention of returning to centre line as soon as practicable:

- (a) the pilot should establish contact with other aircraft, if possible, on the appropriate VHF inter-pilot air to air frequency; and
- (b) one (or both) aircraft may initiate lateral offset(s) not to exceed 2 NM from the assigned track, provided that:
 - i) as soon as practicable to do so, the offsetting aircraft notify ATC that ***temporary*** lateral offset action has been taken and specify the reason for doing so (***ATC will not normally respond***); and
 - ii) the offsetting aircraft notify ATC when re-established on assigned route(s) or track(s) (***ATC will not normally respond***).

9.0 Transition areas

9.1 Transition areas from RVSM to non-RVSM airspace within the Oakland, Los Angeles, Seattle and Anchorage FIR's are published under separate NOTAMS.

10.0 Flight planning

10.1 RVSM approval is required for aircraft to operate within RVSM airspace. The operator must determine that the appropriate State authority has approved the aircraft and

will meet the RVSM requirements for the filed route of flight and any planned alternate routes. The letter “**W**” shall be inserted in item 10 (Equipment) of the ICAO standard flight plan to indicate RVSM approved aircraft.

10.2 Non-RVSM Compliant Aircraft.

10.2.1 Non-RVSM compliant civil aircraft may not flight plan between FL290 and FL390 inclusive within RVSM airspace, **except** non-RVSM civil aircraft unable to fly to an appropriate destination at or below FL280 and unable to fly at or above FL410 may flight plan at RVSM flight levels in the RVSM stratum provided the aircraft:

- (a) is being initially delivered to the State of Registry or Operator; or
- (b) was formerly RVSM approved but has experienced an equipment failure and is being flown to a maintenance facility for repair in order to meet RVSM requirements and/or obtain approval; or
- (c) is being utilized for mercy or humanitarian purposes.

10.2.2 Aircraft operators requesting approval as above shall:

- (a) if departing within Oakland FIR or Anchorage FIR, obtain approval from the appropriate Oceanic Control Center normally not more than 12 hrs and not less than 4 hrs prior to the intended departure time; or
- (b) if transiting Oakland FIR or Anchorage FIR, notify the appropriate Oceanic Control Center after approval is received from the first affected Center and prior to departure. (note that filing of the flight plan is not appropriate notification), and
- (c) include the remarks "APVD non-RVSM" in Field 18 of the ICAO Flight Plan.

10.2.3 Contact details for approval request or notification are as follows:

Oakland ARTCC Telephone: 1-510-745-3342

AFTN: KZOAZRZX

FAX: 1-510-745-3411

Anchorage ARTCC Telephone: 1-907-269-1108

AFTN: PAZAZQZX

FAX: 1-907-269-1343

10.2.4 Non-RVSM aircraft operating in the RVSM stratum will be separated from all other aircraft by a minimum 2000 ft vertical separation.

10.2.5 This approval process is intended exclusively for the purposes indicated above and not as a means to circumvent the normal RVSM approval process.

11.0 State aircraft that are not RVSM compliant

11.1 Operators of State aircraft (military, customs or police service) that are **not** RVSM compliant may flight plan within Oakland FIR or Anchorage FIR RVSM airspace in accordance with the requirements of paragraphs 10.2.2 (b), 10.2.2 c), 10.2.3 and 10.2.4. Also, the United States requires operators of State aircraft that are not RVSM approved intending to operate in the Anchorage Oceanic and Oakland Oceanic flight information regions to notify the appropriate Oceanic Center not more than 72 hours and not less than **4 hrs** prior to the intended departure time. If transiting Oakland FIR or Anchorage FIR, notify the appropriate Control Center of intentions prior to departure. (Note that filing of the flight plan is not appropriate notification. Notification constitutes approval).

11.2 The requirements of 10.2 may not be applicable in other flight information regions for State aircraft, dependent on requirements for those flight information regions.

12.0 Operation of non-RVSM aircraft within RVSM airspace

12.1 Vertical separation applied. It should be noted that RVSM approved aircraft will be given priority for level allocation over non-RVSM approved aircraft. The vertical separation minimum between non-RVSM aircraft operating in the RVSM stratum and all other aircraft is 2,000 ft.

12.2 Climb and descent through RVSM airspace. Non-RVSM compliant aircraft may be cleared to climb to and operate above FL 390 or descend to and operate below FL 290 provided that they:

- a) Do not climb or descend at less than standard rate and...
- b) Do not level off at an intermediate level while passing through the RVSM stratum.

13.0 Procedures for suspension of RVSM

13.1 Air traffic services will consider suspending RVSM procedures within affected areas of the Oakland FIR or Anchorage FIR when there are pilot reports of greater than moderate turbulence. Within areas where RVSM procedures are suspended, the vertical separation minimum between all aircraft will be 2,000 ft.