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COMMERCIAL AND BUSINESS AVIATION ADVISORY CIRCULAR

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Southern Domestic Reduced Vertical Separation Minimum and Reduced Vertical Separation Minimum Approval Process

INTRODUCTION

The purpose of this *Commercial and Business Aviation Advisory Circular* (CBAAC) is to inform air operators and private operators of NAV CANADA's proposed expansion of Reduced Vertical Separation Minimum (RVSM) airspace to include Canadian Southern domestic airspace with a target date of January 20, 2005. This project is referred to as Southern Domestic RVSM (SDRVSM). Currently Canadian airspace north of 57ºN latitude is RVSM airspace between Flight Level (FL) 290 and FL 410 inclusive. The planned change will result in all Canadian airspace between FL 290 and FL 410 being designated as RVSM airspace.

This CBAAC supercedes and replaces CBAAC 0186 entitled Canadian Reduced Vertical Separation Minimum (RVSM) Airspace, published June 29, 2001.

For Canadian private operators and air operators, Transport Canada, Civil Aviation (TCCA) provides the authorization for operations within RVSM airspace by an Operations Specification (Ops Spec) to their Private Operator Certificate (POC) or Air Operator Certificate (AOC). Canadian operators who already have RVSM authorization for operations in Northern Canadian RVSM Airspace, North Atlantic and/or Pacific meet the technical height-keeping requirements for SDRVSM airspace. However, there are other Canadian operators who do not yet have RVSM authorization from TCCA.

Authorization from TCCA is required prior to the January 20, 2005, implementation date, to preclude being excluded from operations within SDRVSM airspace.

The process for obtaining an RVSM Ops Spec is outlined in this CBAAC.

APPLICABILITY

The information in this CBAAC applies to Canadian air operators and Foreign air operators holding an AOC or a Foreign Air Operator Certificate issued under Part VII, or a private operators holding an AOC issued under Part VII or a POC issued under Subpart 4 of Part VI, of the *Canadian Aviation Regulations* (CARs) seeking authority to operate in RVSM airspace.

REFERENCES

The following references provide additional guidance and advisory material on operations in RVSM airspace:

1. Part VI, subpart 4 of the CARs and sections 701.08, 722.08, 723.08, 724.08 and 725.08 (Contents of a POC or AOC – Navigation System Authorizations) of the Commercial Air Service Standards (CASS).

2. *Aeronautical Information Publication* (AIP) Canada, section Rules of the Air and Air Traffic Services (RAC).

3. *International Civil Aviation Organization* (ICAO) DOC 9574-AN934, Manual on the Implementation of a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive.

4. ICAO NAT DOC 001, *Guidance and Information Material Concerning Air Navigation in the North Atlantic Region*.

5. *North Atlantic Minimum Navigation Performance Specifications (MNPS) Airspace Operations Manual* (9th Edition).

6. *Federal Aviation Administration* (FAA) *Interim Guidance Material on the Approval of Operators/Aircraft* for RVSM Operations 91-RVSM Change 1.

7. *Joint Aviation Authorities* (JAA) *Temporary Guidance Leaflet* (TGL) No. 6 - Revision 1.

8. ICAO Regional Supplementary Procedures (Document 7030/4).

BACKGROUND

All air operators and, private operators and Foreign air operators (*the operator*) intending to operate within RVSM airspace are required to be equipped with altimetry and height-keeping systems, which meet RVSM Minimum Aircraft System Performance Specifications (MASPS). *Operators* also require special authorization (Ops Spec) from the State of Registry of the aircraft, or the State of the Operator prior to operating within this airspace. *Operators* without this authorization are excluded from flying within RVSM airspace.

In the late 1970s, faced with rising fuel costs and growing demands for a more efficient use of the available airspace, ICAO initiated a comprehensive project of studies to examine the feasibility of reducing the 2000 ft Vertical Separation Minimum (VSM) applied above FL 290, to the 1000 ft VSM as used below FL 290. Studies conducted in the 1980s demonstrated that this concept was safe and feasible. RVSM was implemented in the North Atlantic Region in a phased approach commencing in March 1997, and in certain portions of the Pacific Region on February 24, 2000. In conjunction with the implementation of RVSM in the North Atlantic Region and Pacific Region, two RVSM transition areas were established in Canadian Domestic Airspace.

RVSM was implemented in the West Atlantic Route System (WATRS) on November 1, 2001, in the European Region on January 24, 2002, in the Western Pacific/South China Sea in February 2002, in Northern Canadian Airspace in April 2002 and, in the Mid East Region on November 27, 2003.

INTRODUCTION OF RVSM IN THE UNITED STATES AND SOUTHERN CANADA

The FAA issued a Notice of Proposed Rulemaking on May 10, 2002, announcing its intention to implement RVSM in all United States (US) Domestic airspace between FL 290 and FL 410 inclusive, (referred to as Domestic RVSM or DRVSM) in December 2004. This date has since been changed to

January 20, 2005. Due to the volume and complexity of air traffic along the Canada/US border, it is essential that Canada and the US harmonize the implementation of RVSM. In order to accomplish this, NAV CANADA announced on October 3, 2002, the initiation of the SDRVSM project. The expansion of RVSM in Canadian airspace will occur concurrently with the implementation of DRVSM in US Domestic airspace.

RVSM APPROVAL PROCESS

The process for obtaining authorization to operate in RVSM airspace requires coordination between the *operator*, the TCCA Principal Operations Inspector (POI), the Principal Maintenance Inspector (PMI), the *operator*'s TCCA Regional Airworthiness office and TCCA Certification Standards.

The "FAA Advisory Circular 91-RVSM Interim Guidance Material on the Approval of Operators/Aircraft for RVSM Operations" was written by the FAA and then adopted by ICAO for the use of all Member States (including Canada) in their authorization programs. Paragraphs 722.08 (2)(d), 723.08 (2)(d), 724.08 (2)(d) and 725.08 (2)(d) of the CASS make specific reference to this document, as well as ICAO NAT DOC 001 for RVSM standards.

The following steps provide a brief outline of the process that should be followed by an *operator* seeking RVSM operational authority:

1) The *operator* determines the need to operate within an RVSM airspace region. Given the recent implementation of RVSM in Northern Canada and Europe, and the plans to implement RVSM in the US and southern Canada by January 2005, it is expected that most *operators* of jet aircraft will need RVSM authority, before January 20, 2005.

2) Each *operator* determines the suitability of his/her aircraft type(s) for RVSM approval. This may be accomplished by contacting the aircraft manufacturer or the TCCA Regional Airworthiness office.

New aircraft types are typically delivered from the manufacturer configured for RVSM operations. Most other aircraft types can be modified for RVSM operations by incorporating the provisions prescribed in a Service Bulletin (SB) issued for that purpose. Refer to "Aircraft Engineering Packages" on the following website: http://www.faa.gov/ats/ato/rvsm_documentation.htm for further information on the availability of an SB for a particular aircraft. Contact points for most aircraft manufacturers are listed on the same web page under "contact points". Certain older types such as the HS125 series 1 through 600 are not expected to be eligible for RVSM approval although this may change if there is sufficient demand to develop a SB.

The *operator* should arrange to have the SB completed (if required) on his/her aircraft as early in the approval process as possible since the approval of an individual aircraft is dependent on it being in compliance with the RVSM airworthiness requirements.

Both the *operator* and the TCCA inspector shall be familiar with the Aircraft Flight Manual (AFM) amendments and the content of the SB for the aircraft types for which an *operator* is seeking approval for RVSM operations. These AFM amendments and SB are issued by aircraft manufacturers and describe the requirements that must be fulfilled for RVSM approval on a particular type. The

AFM amendments may contain operational restrictions such as maximum or minimum airspeed/mach during flight in RVSM airspace, use of air data computers/transponders, or a maximum operating altitude or weight. Any operational restrictions should be adequately addressed in the Operations Manual, Training Programs, Standard Operating Procedures (SOPs), Minimum Equipment Lists (MEL) and related documentation. The POI will consult with the TCCA Regional Airworthiness office that oversees the *operator*'s maintenance program to confirm that the RVSM SB has been complied with, and obtain the date of compliance.

3) The *operator* develops a training program for flight crew and maintenance personnel. Amendments to the Company Operations Manual (COM), Operational Control, SOPs, Checklists and Maintenance Control Manual (MCM) are required. The aircraft MEL shall be amended in accordance with the approved Master Minimum Equipment List supplement for RVSM operations.

Information on the training requirements can be found in Appendix 4 of FAA Document 91-RVSM. Additional training is required for specific areas of RVSM operations that are new to the *operator* or crewmember. Appendix 5 of FAA Document 91-RVSM deals with specific procedures for oceanic airspace. For *operator* planning to fly in European RVSM airspace, the JAA Guidance Leaflet No. 6 (TGL 06) (which can be found at the following address: http://www.ecacnav.com/rvsm/library.htm), will provide information on training issues that may be unique to European airspace. ICAO document 7030/4 (EUR), Regional Supplementary Procedures, provides details of procedures for various international airspace areas. It is the responsibility of the *operator* to ensure that their flight crews are properly trained for the intended area(s) of operation.

RVSM exclusionary airspace has been, or is being introduced into several regions other than Canada. The technical height-keeping requirements of these areas remain essentially the same. It is intended that an RVSM approval in one area will provide RVSM technical height-keeping approval to operate at RVSM altitudes within other RVSM areas, however, this does not necessarily provide approval to fly in that airspace if other conditions must be met (e.g. NAT-MNPS or Required Navigation Performance (RNP-10)). The Pilot-in-Command is responsible for the operation of the aircraft and must therefore comply with the policies and procedures applicable to each area of operations.

The list below provides the minimum training requirements for RVSM approved flight crew. It is also intended to show those subjects on which an *operator* must be informed prior to conducting a flight in a new area of RVSM operations:

a. Floor, ceiling and horizontal boundaries of RVSM airspace;

b. Policy on exclusion of aircraft not RVSM approved;

c. Pilot procedures:

    i. Special procedures for in-flight contingencies;

    ii. Weather deviation procedures;

iii. Track offset procedures for wake turbulence and nuisance aircraft system alerts;

iv. Pilot level-off call.

d. Procedures for flight of non-RVSM approved aircraft for maintenance, humanitarian and delivery flights.

e. Use of Airborne Collision Avoidance System/Traffic Alert and Collision Avoidance System.

4) At least ninety days in advance of planned RVSM operations:

a. The *operator* coordinates with TCCA Regional Airworthiness office to obtain airworthiness approval of their aircraft. Refer to the Aircraft Certification Policy Letters (ACPL) 056 (reference document 4) paragraph 6.0 for further details on this process. The documentation obtained in step 2 above should be included.

b. The *operator* submits his training program, amended COM, SOPs, amended MEL and MCM to his POI and PMI. The POI/PMI review the training program and manuals for appropriate information based on area(s) of intended operation.

c. The *operator* arranges for height-keeping monitoring of aircraft as outlined in the following section. The requirements for height-keeping monitoring are dependent on several factors, such as type(s) of aircraft being used, area(s) of operation and previous RVSM experience. The monitoring requirements for aircraft planning to operate in North American airspace where RVSM is in effect are available on the following website: http://www.tc.faa.gov/act-500/niaab/rvsm/naarmo_intro.asp

RVSM HEIGHT-KEEPING MONITORING PROGRAM

It is important to note that monitoring requirements are ***operator* and type specific**. Previous height-keeping monitoring of an aircraft under a different operating certificate does not count towards the monitoring requirements for a new *operator*. It is also critical to note that height-keeping monitoring events prior to the RVSM airworthiness approval being signed off will not be accepted by the monitoring agencies.

Depending on the aircraft type, the initial requirement for the height-keeping monitoring can follow RVSM authorization as discussed below.

Height-keeping monitoring is required prior to RVSM authorization where the regional monitoring agency has insufficient data on the aircraft type or for a new aircraft type produced by a manufacturer without a demonstrable track record of production of MASPS compliant airframes. Typically, the monitoring requirements are 60% of the *operator*'s fleet for a specific aircraft type.

Height-keeping monitoring is not required prior to RVSM authorization once the monitoring agency has observed a sufficient percentage of the world's fleet of a particular type, with satisfactory results. The monitoring requirement for individual *operator* is reduced to 10% of the particular type or two aircraft (whichever is greater). Operational authorization can be granted prior to height-keeping monitoring, provided the aircraft is in the category that has had sufficient height-keeping monitoring data previously collected. In this case, height-keeping

monitoring is required not later than six months after issue of RVSM authorization. Height-keeping monitoring methods are described in the AIP Canada, RAC section.
There are two methods available for height- keeping performance monitoring:

1. Aircraft can overfly a Height Monitoring Unit (HMU), located at Gander, Newfoundland. The procedures for height-keeping monitoring are described in the AIP Canada, subparagraphs 11.23.6 through 11.23.8 of the RAC section, as well as subparagraphs 12.16.8 and 12.16.9 of the same section. Additional ground based HMU's are expected to become available in late 2004 and will be located Near Ottawa, Ontario and Lethbridge, Alberta.

2. The second method is to use a Global Positioning System (GPS) Monitoring Unit, (GMU). GMU service is provided by two commercial operations, CSSI Inc. and Aeronautical Radio, Incorporated (ARINC). Information on how to arrange for height-keeping monitoring with a GMU is available in the AIP Canada, paragraph 12.16.9 of the RAC section, or at the following addresses: http://www.arinc.com/products/rvsm/ or http://www.cssiinc.com/rvsm/

RVSM DATABASE INFORMATION

The following information is required for each aircraft that is approved for RVSM operations. This information shall be forwarded by the Regional Certification Office to Certification Standards where it will be added to the Canadian RVSM database. The Certification Office should forward preliminary information as soon as the *operator* makes application for RVSM authorization. Additional information is to be sent as the steps are completed. This database is distributed to all international monitoring agencies responsible for monitoring RVSM operations:

1. State of Registry of the aircraft (e.g. Canada);
2. *Operator* (e.g. Air Canada); (include three letter ICAO designator);
3. State of *Operator* (e.g. Canada);
4. Aircraft type (ICAO Aircraft Type designation e.g. A310);
5. Aircraft mark/series (e.g. - 300);
6. Manufacturer's serial/construction number;
7. Registration (e.g. C-FXXX);
8. Aircraft mode S address code in hexadecimal format (e.g. C0123A);
9. Date aircraft SB completed;
10. Date at which the airworthiness approval was issued; (e.g. the date the aircraft is certified as having been modified in accordance with the relevant approval documentation, e.g. SB Supplemental Type Certificate (STC) and is therefore eligible for monitoring. The date of issue of such approval should coincide with

the date on which the modification was certified by the *operator* as being complete);

11. Date of Airborne Flight Monitor (this may be sent later depending on the requirement due to aircraft type or if required); and

12. Date of RVSM approval (e.g. the date Ops Spec issued.

OPERATIONS SPECIFICATION FOR OPERATIONS IN RVSM AIRSPACE

Before issuing an Ops Spec, the POI will confirm that both the *operator*'s maintenance and operational programs have been approved for RVSM. The RVSM Ops Spec shall identify the aircraft types and the individual aircraft by registration. Immediately after the issuance of an Ops Spec or addition of an aircraft to an existing Ops Spec, the registration of each aircraft and the date of the authorization shall be sent to Certification Standards to update the Canadian RVSM database as discussed above.

REMOVAL OF RVSM AUTHORIZATION

RVSM approved aircraft that are removed from the *operator*'s Operating Certificate, or lose their RVSM approval for any reason, must be reported by the Regional Certification Office, to Certification Standards immediately in order to maintain the accuracy of the RVSM database.

REFERENCE DOCUMENTS FOR AREA SPECIFIC POLICY/PROCEDURES

a. Canada. Refer to the AIP Canada, paragraph 12.16 of the RAC section

b. NAV CANADA Website: http://www.navcanada.ca/navcanada.asp

c. North Atlantic region:

   i. North Atlantic MNPS Manual (9th edition) can be downloaded from the North Atlantic Program Coordination Office (NAT PCO) website at the following address: www.nat-pco.org,

   ii. AIP Canada, paragraph 11.23 of the RAC section;

   iii. FAA Domestic/International NOTAM Book can be downloaded from the following address: www.faa.gov/NTAP;

d. WATRS Information on the WATRS area is published on the FAA RVSM website at the following address: www.faa.gov/ats/ato/watrs.htm;

e. Pacific region:

   i. Paper entitled "Pacific RVSM: Operational Policy/Procedures" is published on the FAA RVSM website "RVSM Documentation, Pacific" section. The paper discusses the content of an FAA Notice to Airmen (NOTAM) on the subject, as well a Pacific State AIP providing policy/procedures. This website can be found at the following address: http://www.faa.gov/ats/ato/rvsm_documentation.htm;

ii. Regional ICAO Procedures for the Pacific are contained in ICAO Doc 7030/4, Regional Supplementary procedures.

FUTURE DISPOSITION

This CBAAC will remain in effect until it is replaced by revised information or until further notice.

CONCLUSION

For additional information on RVSM authorization, contact Commercial and Business Aviation, Operational Standards at (613) 990-1868.

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