



# **EL02 - EUROPEAN REDUCED VERTICAL SEPARATION MINIMA ( SUNEXPRESS )**

## **COURSE OUTLINES**

Ref	C101SUNEX
Page	2 / 7
Rev	1.3
Date	2022-07-07

## TABLE OF CONTENT

<b>COURSE START</b>	<b>3</b>
-----	-----
<b>EUR RVSM SUNEXPRESS</b>	<b>3</b>
-----	-----
<b>COURSE END</b>	<b>7</b>
-----	-----

Ref	C101SUNEX
Page	3 / 7
Rev	1.3
Date	7/7/22 12:00 AM

### COURSE START

1-LEGAL CAUTION The material contained in this training program is based on the information obtained from current national, international and company regulations and it is to be used for training purposes only. At the time of designing this program contained then current information. In the event of conflict between data provided herein and that in publications issued by the authority, the authority shall take precedence.

### EUR RVSM SUNEXPRESS

2-Welcome to RVSM reduced vertical separation minima recurrent e learning course.Revision No : 01 Revision Date : 30 JUN 2022.

3-This course is prepared to meet the requirements of recurrent training and checking program, stated in Operations Manual Part D and other related official publications. At the end of this course you will be reviewed all the information about RVSM, which is explained in the Operational Manual Part A, Operational Manual Part B, Q R H, the Lido Route Manual General Part and SXS CDL/MEL .

4-CAUTION. The content in this presentation is for TRAINING PURPOSES ONLY. Current national / International or State Regulations and Company Manuals shall take precedence in the event of conflict.

5-Objective; At the end of these course the trainee will refresh and update his knowledge about RVSM according to related documents.

6-Overview, In this lesson we will talk about : \* Introduction of RVSM. \* Equipment Requirements. \* Operational Procedures. \* System Performance. \* Standard Phraseology.

7-INTRODUCTION OF RVSM.

8-RVSM is an acronym of Reduced Vertical Separation Minima or Minimum is also used for definition. Aircraft shall only be operated in designated airspace where a reduced vertical separation minimum of one thousand feet applies between flight level two niner zero and flight level four one zero, inclusive, if the competent authority approved to conduct such operations. RVSM is approved for SunExpress aeroplanes and flight crew. For procedures and requirements refer to OMB Chapter 1, SXS-FCOM and OMC.

9-It allows aircraft to safely fly more optimum profiles, gain fuel savings and increase airspace capacity. The process of safely changing the separation standard required a study to assess the actual performance of airspace users under the old vertical separation standard of two thousand feet and potential performance under the new standard one thousand feet.

10-In 1988, the I K O Review of General Concept of Separation Panel completed this study and concluded that safe implementation of the one thousand feet separation standard was technically feasible. RVSM was subsequently implemented and today RVSM represents a global standard for one thousand feet vertical separation. Since 24 th of

Ref	C101SUNEX
Page	4 / 7
Rev	1.3
Date	7/7/22 12:00 AM

January 2002 it has been used for European Airspace.

11-RVSM operation differences of the countries can be seen from related Country's CRAR.

12-The table of cruising levels for use in RVSM airspace, shall be used. For some regions, regulations may differ from the standart rules and regulations. Refer to country rules and regulations section in Lido Route Manual for specific countries.

13-EQUIPMENT REQUIREMENTS.

14-Aircraft used for operations in RVSM airspace shall be equipped with: \* Two independent altitude measurement systems; \* An altitude alerting system; \* Secondary surveillance radar (SSR) transponder with altitude reporting system that can be connected to the altitude measurement system in use for altitude control. \* An automatic altitude control system;

15-OPERATIONAL PROCEDURES.

16-The types of Airplane Operation is indicated in our procedure OMB. It can be easily seen that Sunexpress can continue its flight operations in RVSM approved area.

17-RVSM airworthiness approval has been obtained from the competent authority.

18-Flight planning; During flight planning the flight crew should pay particular attention to conditions that may affect operation in RVSM airspace. These include, but may not be limited to: \* verifying that the airframe is approved for RVSM operations; \* reported and forecast weather on the route of flight; \* minimum equipment requirements pertaining to height-keeping and alerting systems; and \* any airframe or operating restriction related to RVSM operations.

19-Review technical logs and forms to determine the condition of equipment required for flight in the RVSM airspace. Ensure that maintenance action has been taken to correct defects to required equipment. Two primary altimeters, 1 altitude alert, one transponder with altitude reporting function and one autopilot are required functional for RVSM operation as we mentioned on previous slides.

20-Related to our company procedure, After Obtaining ATIS, all three altimeters are set by First Officer to check RVSM situation.

21-For Manual Flight Plan (for contingency operation), there is a manual input section for RVSM. During our preflight check, recording of altimeter values is not required, is not mandatory.

22-During the external inspection of aircraft, particular attention should be paid to the condition of static sources and the condition of the fuselage skin near each static source and any other component that affects altimetry system accuracy.

23-On the ground, during preflight procedures, receive the last ATIS information and set the QNH to the altimeters and

Ref	C101SUNEX
Page	5 / 7
Rev	1.3
Date	7/7/22 12:00 AM

then check altimeter readings. Maximum difference between captain and first officer altimeter is 50 feet up to field elevation of 5000 feet, and 60 feet for the field elevation higher than 5000 feet. Maximum difference between captain or first officer altimeters and field elevation is 75 feet. Besides, as a preflight checklist item; when you are answering "flight instruments" item, keep your eyes on the Altimeters to see maximum differences between captain or F/O and Field Elevation.

24-Before take-off, equipment required for flight in RVSM airspace should be operative and any indications of malfunction should be resolved. Where applicable, aircraft operators should revise their operations manuals to reflect any differences in standard operating procedures that result from operation in RVSM airspace.

25-Verify that the aircraft is RVSM capable in accordance with the minimum equipment list.

26-The following equipment should be operating normally at entry into RVSM airspace: two primary altitude measurement systems. A cross-check between the primary altimeters should be made. A minimum of two will need to agree within 200 feet. Failure to meet this condition will require that the altimetry system be reported as defective and air traffic control notified; \* one automatic altitude-control system; \* one altitude-alerting device; and \* operating transponder. Prior to enter RVSM airspace: Check that the required equipment for RVSM airspace is still operative. Should any of this equipment fail prior to entering the RVSM airspace inform ATC and request new clearance.

27-Make sure all primary and standby altimeters set to standart value, 1013 hPa when passing the transition altitude, and recheck for proper altimeter setting when reaching the initial cleared flight level. The initial altimeter cross-check of primary and standby altimeters should be recorded, Engage VNAV.

28-Any of the required equipment fail prior to the aircraft entering RVSM airspace, the pilot should request a new clearance to avoid entering this airspace.

29-When you are within an RVSM airspace, check electric altimeter and standby pneumatic altimeter altitude indications after every level change. Writing down RVSM value is nat mandatory.

30-During Cruise Flight, PM gives cruise briefing to PF. This briefing should cover many items as you can read. This briefing also includes RVSM check information.

31-Use autopilot to maintain cleared flight level.

32-When changing levels, the airplane shall not be allowed to overshoot or undershoot the cleared flight level by more than 150 feet.

33-At intervals of approximately one-hour, cross-checks between the primary altimeters should be made. The usual scan of flight deck instruments should suffice for altimeter crosschecking on most flights; no need to record on OFP. Remember that the maximum in flight difference between Captain and First Officer altitude display is 200 feet. Standby altimeters do

Ref	C101SUNEX
Page	6 / 7
Rev	1.3
Date	7/7/22 12:00 AM

not meet altimeter accuracy requirements of RVSM airspace.

34-In case the airplane cannot hold the cleared flight level for any reason, such as equipment failure, severe turbulence, etc, request new ATC clearance. Remember to make TLB entry if any RVSM equipment has been failed.

35-Inform ATC in case function of faulty equipment could be resumed.

36-Loss of any equipment required for RVSM operation, any other equipment failure affecting the ability to maintain cleared flight level, and encountering severe turbulence should be notified to ATC.

37-In case of malfunctions in the altitude control system these information shall be provided in the Technical Log Book, to enable maintenance to effectively troubleshoot and repair the system. The following information should be recorded when appropriate: i. primary and standby altimeter readings; ii. altitude selector setting; iii. subscale setting on altimeter; iv. autopilot used to control the aircraft and any differences when an alternative autopilot system was selected; v. differences in altimeter readings, if alternate static ports selected; vi. use of air data computer selector for fault diagnosis procedure; and vii. the transponder selected to provide altitude information to ATC and any difference noted when an alternative transponder was selected. viii. Crew action taken to try to isolate and rectify the fault.

38-You will see MEL item that affects RVSM operation as a sample.

39-As seen on the sample, if the relating item has an effect for RVSM operation, it has to be stated in the Note section, such as; RVSM operation is not possible according to AFM or One must be operative for RVSM operations.

40-According to QRH, ALTITUDE DISAGREE Condition: The ALTITUDE DISAGREE alert indicates the captain's and first officer's altitude indications disagree by more than 200 feet. If ALTITUDE DISAGREE alert light stays illuminated after checking all altimeters are set correct barometric setting for phase of flight, Airplane does not meet RVSM airspace requirements.

41-SYSTEM PERFORMANCE.

42-RVSM Height-keeping Errors. Recorded or communicated occurrences of height-keeping errors caused by malfunction of aircraft equipment or of operational nature, shall be reported if equal to or greater than: a total vertical error T V E, which also equals an altimeter system error plus assigned altitude deviation, of plus minus 300 feet; an altimeter system error ASE of plus minus 245 feet; and an assigned altitude deviation AAD of plus minus 300 feet. Reports of such occurrences shall be sent to the competent authority within 72 hours. Reports shall include an initial analysis of causal factors and measures taken to prevent repeat occurrences. When height-keeping errors are recorded or received, the operator shall take immediate action to rectify the conditions that caused the errors and provide follow-up reports, if requested by the competent authority.

43-STANDARD PHRASEOLOGY.

Ref	C101SUNEX
Page	7 / 7
Rev	1.3
Date	7/7/22 12:00 AM

44-Circumstances and Phraseologies displayed on the screen should be used for RVSM operation:

45-In this lesson we have talked about : \* Introduction of RVSM. \* Equipment Requirements. \* Operational Procedures. \* System Performance. \* Standard Phraseology.

46-This is the end of RVSM, Reduced Vertical Separation Minima E-learning presentation. Please fill in the questionnaire form and send it just before taking the exam. For the feedback do not hesitate to get in touch with the training department. Next you should take the examination about this subject to completely finish the course. Have a safe flight.

### **COURSE END**

47-End of the Course