ATS Training Guidance Material

AFI AIR TRAFFIC SERVICES REDUCED VERTICAL SEPARATION MINIMA COURSE OUTLINE (ICAO 59)

Version: Draft
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Course Aim:

The course will equip participants with the knowledge, skills and attitudes required to provide air traffic services within the designated RVSM and transition airspaces in the AFI Region, after completion of a period of on-the-job-training as prescribed by the specific national authority.

Delivery Method:

The training will be delivered by means of Theoretical lectures, Classroom exercises and Simulator exercises.

Language:

The course will be delivered in the English language.

Pre-requisite Learning:

Trainees should hold valid Area Procedural and/or Area Radar ratings.

Who Should Attend the Course:

- Managers of Air Traffic Service Units where Area control is provided for the designated AFI RVSM airspace and airspace adjoining RVSM airspace.
- Supervisors of Air Traffic Service Units where Area control is provided for the designated AFI RVSM airspace and airspace adjoining RVSM airspace.
- Air traffic controllers providing Area control for the designated AFI RVSM airspace and airspace adjoining RVSM airspace.

Note: The information contained in this course will be also of use to air traffic controllers not working in the Area Control Centres. Examples are Approach and Aerodrome controllers working in sectors adjoining the designated RVSM or RVSM Transition airspaces or where those controllers have to interact with the Area Control Centres providing the service in the designated RVSM or RVSM Transition airspaces. Such controllers should be regarded as the secondary target population for the training.

Course Duration:

Five days, consisting of:

- Nine (9) periods of theory lectures and one period of theory assessment.
- Twenty six (24) periods of practical, this includes one (1) assessment per delegate.
- Two periods for course administration (course opening and closing and delegate arrival etc).

Assessment criteria:

Trainees are required to successfully complete:

- A written assessment, by achieving seventy (70) percent or more.
- A practical assessment, by achieving seventy (70) percent or more.

Trainees will be allowed a once off reassessment in each of the above-mentioned assessments provided that a score of at least fifty (50) percent is achieved during the first attempt. Reassessments must be completed during the normal duration of the course.

1. Historical Background of RVSM. (Duration: 1 Period)

This module will provide the trainees with an awareness of the historical development of RVSM in ICAO.

1.1 Topic: The Origins of 2000 feet above FL 290.

Objective: Trainees will be aware of the origins of 2000 feet above FL 290.

Content:
- 1947 PANS RAC Vertical Separation.
- Reason for formation of Vertical Separation Panel in June 1954.
- 1960 PANS RAC Vertical Separation.
- Disbandment of the Vertical Separation Panel.

1.2 Topic Development of RVSM in other Regions

1.3 Topic: The need for RVSM in Europe.

Objective: Trainees will be aware of the need for RVSM in Europe.

Content:
- Cost/benefit analysis.
- Benefits of RVSM.

1.4 RVSM in AFI Region.

1.4.1 Topic: Background of RVSM in AFI.

Objective: Trainees will be aware of the background to RVSM in AFI.

Content:
- Extension of RVSM in AFI Region.

1.4.2 Topic: The need for RVSM in AFI Region.

Objective: Trainees will be aware of the need for RVSM in AFI Region.

Content:
- Cost/benefit analysis.
- Benefits of RVSM.

1.4.3 Topic: The RVSM programme organisation in the AFI Region.

Objective: Trainees will be aware of programme organisation and structures for RVSM in AFI Region.

Content:
- AFI RVSM Strategy.
- Regional RVSM Structure.
- RMA.
- National RVSM Structure.

2. Aircraft Certification. (Duration: 1 Period)

This module will provide the trainees with an awareness of the requirements and processes involved with the certification and approval of aircraft to operate with the designated RVSM airspace in the AFI region.

2.1 Approval Procedure.

2.1.1 Topic: State Approval Process.

Objective: Trainees will be aware of the state approval process.

Content:
- Responsibilities of the aircraft operator.

2.1.2 Topic: RVSM Approval Application.

Objective: Trainees will be aware of the content of an operator's RVSM approval application.

Content:
- Approval requirements.
- Content of operator application.

2.1.3 Topic: Issue of RVSM Approval

Objective: Trainees will be aware of the procedure for issue of an RVSM approval.

Content:
- Approval documents.

2.1.4 Topic: Suspension or Revocation of RVSM Approval.

Objective: Trainees will be aware of the procedure for the suspension or revocation of an RVSM approval.

Content:
- Occurrences to be reported.
- Operator's action.
- Reinstatement of approval.

2.2 Certification Requirements.

2.2.1 Topic: Airworthiness Requirements.

Objective: Trainees will be aware of the airworthiness requirements for RVSM approval

Content:
- Aircraft groupings.
- Flight envelopes.
- Performance data.
- Continued airworthiness.

2.2.2 Topic: Operational Requirements.

Objective: Trainees will be aware of the operational requirements for RVSM approval.

Content:
- Training programmes.
- Operating practices, procedures, manuals and checklists.

2.3 ACAS.

2.3.1 Topic: ACAS.

Objective: Trainees will be aware of the ACAS requirements for the AFI RVSM environment.

Content:
- ACAS II requirements.
- TCAS II Version 6.04A.
- TCAS II Version 7.

3. Safety and Monitoring. (Duration: 1 Period)

This module will provide the trainees with an awareness of the safety case and monitoring of RVSM

3.1 Safety.

3.1.1 Topic: Collision Risk Model.

Objective: Trainees will be aware of the state approval process.

Content:
- Responsibilities of the aircraft operator.

3.2 Monitoring.

3.2.1 Topic: The need for monitoring.

Objective: Trainees will be aware of the need to monitor.

Content:
- TLS

3.2.2 Topic: Height Monitoring Targets.

Objective: Trainees will be aware of the height monitoring targets.

Content:
- Height keeping errors.
- Monitoring targets.

3.2.3 Topic: Height Monitoring Systems.

Objective: Trainees will be aware of the height monitoring systems.

Content:
- HMU.
- GMU.
- Height monitoring programme.

4. Flight Planning. (Duration: 1 Period)

This module will provide the trainees with an awareness of the flight planning elements of RVSM.

4.1 Flight Planning.

4.1.1 Topic: Flight plans (FPL).

Objective: Trainees will be aware of the RVSM flight planning requirements for FPLs.
Content:
- RVSM specific inclusions for FPLs.

4.1.2 Topic: Repetitive flight plans (RPL).

Objective: Trainees will be aware of the RVSM flight planning requirements for RPLs.

Content:
- RVSM specific inclusions for RPLs.

5. Operational Procedures. (Duration: 3 Periods)

This module will provide the trainees with the ability to explain the RVSM Operational Procedures.

5.1 Overview.

5.1.1 Topic: Flight operations within the AFI RVSM airspace.

Objective: Trainees will explain the regulations governing flight operations within the AFI RVSM airspace.

Content:
- Aircraft restrictions.
- Flight conditions.
- Allocation of flight levels.

5.1.2 Topic: Provision of Service to Non-RVSM Approved State Aircraft.

Objective: Trainees will explain the general procedures governing the provision of service to non-RVSM approved State aircraft.

Content:
- Definition of State aircraft.
- Vertical separation minimum.

5.2 General Procedures.

5.2.1 Topic: General Procedures.

Objective: Trainees will explain the general procedures for operations within AFI RVSM airspace.

Content:
- Clearance into RVSM airspace.
- Minimum vertical separation between RVSM aircraft.
- Minimum vertical separation between non-RVSM aircraft and any other.
- Vertical separation minimum for transition task.
- Formation flights by civil aircraft and State aircraft.
- Flight level allocation to non-RVSM approved aircraft other than State aircraft.

5.2.2 Topic: Procedures for State Aircraft Operating as Operational Air Traffic, Crossing ATS Routes, Within the RVSM Airspace.

Objective: Trainees will explain the procedures for State aircraft operating as OAT crossing ATS Routes within the RVSM airspace.

Content:
- Definition of OAT.
- RVSM approval status for OAT.
- Minimum vertical separation.
- Vertical separation minimum where RVSM approval status is known.

5.2.3 Topic: Inter-Centre Co-ordination.

Objective: Trainees will explain the inter-centre co-ordination requirements.

Content:
- Computer-assisted co-ordination of estimate messages.
- Verbal co-ordination of estimate messages.

5.2.4 Topic: Contingency Procedures.

Objective: Trainees will explain the RVSM contingency procedures.

Content:
- Overview.
- Equipment- related procedures.
- Weather-related procedures.

5.2.5 Topic: Vertical Spacing from Prohibited, Restricted, Danger and Temporary Segregated Areas.

Objective: Trainees will explain the minimum vertical spacing associated with activity within Prohibited, Restricted, Danger and Temporary Segregated Areas.

Content:
- Delineation of airspace restrictions.
- Vertical spacing requirements.

5.3 Transition Procedures.

5.3.1 Topic: Traffic exiting RVSM airspace.

Objective: Trainees will explain the procedures applicable to aircraft leaving AFI RVSM airspace.

Content:
- Responsibility.
- Vertical separation minimum.
- Level allocation.

5.3.2 Topic: Traffic entering RVSM airspace.

Objective: Trainees will explain the procedures applicable to aircraft entering AFI RVSM airspace.

Content:
- Responsibility.
- Level allocation.

5.3.3 Topic: Aircraft landing within the lateral limits of RVSM airspace.

Objective: Trainees will explain the procedures applicable to aircraft landing within the lateral limits of RVSM airspace

Content:
- Responsibility.
- Level allocation.

5.3.4 Topic: Aircraft landing outside, and transiting the lateral limits of, RVSM airspace.

Objective: Trainees will explain the procedures applicable to aircraft landing outside, and transiting the lateral limits of, RVSM airspace.

Content:
- Responsibility.
- Level allocation.

5.4 Communications Failure in Flight.

5.4.1 Topic: Communications Failure in transition airspace.

Objective: Trainees will explain the procedures applicable to aircraft within AFI RVSM transition airspace.

Content:
- RVSM airspace west or north of non-RVSM airspace.
- RVSM airspace east or south of non-RVSM airspace.
- Adaptation of route structures.
- Adaptation of ATS local/regional agreements.
- Combination of route structure and agreement adaptation.
- General procedures.

5.4.2 Topic: Communications Failure in Non-Transition RVSM Airspace

Objective: Trainees will explain the procedures applicable to non-transition RVSM airspace.

Content:
- ICAO Communication Failure Procedure.

6. Phraseology. (Duration: 1 Period)

This module will provide the trainees with an appreciation for correct RVSM phraseologies.

6.1 Phraseology.

6.1.1 Topic: Flight operations within the AFI RVSM airspace.

Objective: Trainees will describe the correct controller-pilot RTF phraseology for given situations.

Content:
- To ascertain RVSM approval status.
- Pilot indication of non-RVSM approval status.
- Denial of clearance into RVSM airspace.
- Non-compliance with RVSM due to turbulence.
- Non-compliance with RVSM due to equipment failure.
- Pilot indication of ability to resume RVSM operations.
- Controller request for pilot ability to resume RVSM operations.

6.1.2 Topic: Co-ordination between ATS Units.

Objective: Trainees will describe the correct phraseology to be used in inter-unit co-ordination messages.

Content:
- Supplementary information to automated message exchange without Item 18.
- Supplementary information on non-RVSM approved aircraft.
- Supplementary information on contingency aircraft.

7. Airspace Changes. (Duration: 1 Period)

This module will provide the trainees with an appreciation for the possible changes to airspace structures offered by RVSM.

7.1 Topic: Airspace Considerations.

7.1.1 Topic: Flight Level Allocation Scheme.

Objective: Trainees will consider the impact of RVSM on existing Flight Level Allocation Schemes.

Content:
- Optimisation of existing FLAS.
- Strategic de-confliction of major crossing points.
- FLAS to and from transition areas.

7.1.2 Topic: Sectorisation.

Objective: Trainees will consider the impact of RVSM on sectorisation.

Content:
- Vertical limits of control sectors.
- Reduction in co-ordination of non-RVSM traffic.
- Sector boundary levels.
- Areas of Common Interest.

7.1.3 Topic: Optimisation of ATS Route Structure.

Objective: Trainees will consider the impact of RVSM on the existing route structures.

Content:
- Overview.
- Extension of uni-directional route structure.
- Creation of uni-directional routes in transition areas.

8. Simulated Practical Exercises. (Duration: 24 Periods)

This module will allow the trainees the opportunity to practice and demonstrate competence in various aspects related to RVSM in the operational environment.

8.1 Topic: Simulated practical exercises.

8.1.1 Topic: Exercise 1.

Objective: Introduce trainees to the application of RVSM in designated RVSM airspace.

Content:
- Approved aircraft.
- Application of information indicated on flight progress strips.
- Phraseology.
- Co-ordination with other sectors where RVSM is applied.

8.1.2 Topic: Exercise 2.

Objective: Introduce trainees to the application of RVSM in designated RVSM and adjoining transition airspace.

Content:
- Approved and state aircraft.
- Non-approved aircraft.
- Application of information indicated on flight progress strips.
- Phraseology.
- Co-ordination with other sectors where RVSM is applied and transition airspace.

8.1.3 Topic: Exercise 3.

Objective: Introduce trainees to the application of RVSM in designated RVSM and adjoining transition airspace whilst accommodating contingency procedures related to onboard equipment malfunction.

Content:
- Approved and state aircraft.
- Non-approved aircraft.
- Phraseology.
- Application of information indicated on flight progress strips.
- Co-ordination with other sectors where RVSM is applied and transition airspace.
- Contingency procedures related to onboard equipment malfunction.

8.1.4 Topic: Exercise 4.

Objective: Introduce trainees to the application of RVSM in designated RVSM and adjoining transition airspace whilst accommodating contingency procedures related to weather.

Content:
- Approved and state aircraft.
- Non-approved aircraft.
- Phraseology.
- Application of information indicated on flight progress strips.
- Co-ordination with other sectors where RVSM is applied and transition airspace.
- Contingency procedures related to weather.

8.1.5 Topic: Exercise 5.

Objective: Assess trainees in the application of RVSM in designated RVSM and adjoining transition airspace whilst accommodating contingency procedures related to weather and onboard equipment malfunction.

Content:
- Approved and state aircraft.
- Non-approved aircraft.
- Phraseology.
- Application of information indicated on flight progress strips.
- Co-ordination with other sectors where RVSM is applied and transition airspace.
- Contingency procedures related to weather.

The assessment will be based only on the objectives related to RVSM. The aspects related to normal VSM and ATC operations will not be assessed since trainees will be competent on those aspects.
