

**ANNEX 1 - PART-ATCO**  
**SUBPART D - ATCO TRAINING**  
**Section 2 - Initial training requirements for Air Traffic Controllers**

**AMC1 to Appendix 3 - Basic Training**

- A. General principles that apply to this AMC are contained in ~~the~~<sup>its</sup> enclosed Supplement ~~1 to AMC1~~.
- B. Basic training should contain the following <sup>subject objectives</sup> and training objectives that are associated with the subjects, ~~subject objectives~~, topics and subtopics contained in **Appendix 3 - Basic Training**.
- C. Subjects, ~~subject objectives~~, topics and subtopics from ~~the~~ Appendix 3 are repeated in this AMC for the convenience of the reader and do not form a part of it.

## NPA -> CRD TRACK CHANGES FILE

This document has been provided to help reviewers make a comparison between the corresponding AMCs to appendices of the NPA 2012-18 (15 Nov 2012) and the CRD (30 Sep 2013) of Licensing and medical certification of air traffic controllers Implementing Rule - Part (B.V) ATCO Initial training requirements.

To decode the changes the following conventions have been used:

**Deleted** information is shown with the ~~strikethrough-effect~~

**Relocated** information is shown with the ~~strikethrough-effect~~

**New** information is shown in <sup>blue text</sup>.

When an existing objective has been relocated (and consequently renumbered) the new number is shown in black to the left of the objective and the original number in red below the new one.

3.2.1 - current objective number (if not modified it is the same as in NPA 2012-18 (B.V)

**3.3.3** - old objective number that may have an additional subject indication if moved from one subject to another or B(asic) and R(ating) if moved from one syllabus to another

**1.5.3** - new objective number for relocated objectives at its original location that may have an additional indication of a new subject or B(asic) and R(ating) if moved from one syllabus to another

---

**TABLE OF CONTENTS**

|  |    |
|--|----|
| SUBJECT 1: INTRODUCTION TO THE COURSE----- | 3  |
| SUBJECT 2: AVIATION LAW-----               | 5  |
| SUBJECT 3: AIR TRAFFIC MANAGEMENT-----     | 10 |
| SUBJECT 4: METEOROLOGY-----                | 17 |
| SUBJECT 5: NAVIGATION-----                 | 21 |
| SUBJECT 6: AIRCRAFT-----                   | 25 |
| SUBJECT 7: HUMAN FACTORS-----              | 29 |
| SUBJECT 8: EQUIPMENT AND SYSTEMS-----      | 33 |
| SUBJECT 9: PROFESSIONAL ENVIRONMENT-----   | 37 |
| Supplements -----                          | 39 |

## Subject 1 : INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and how to obtain the appropriate information, and recognise the potential for development of their careers in ATC.

### TOPIC INTRB 1 COURSE MANAGEMENT

#### Subtopic INTRB 1.1 Course introduction

|             |   |   |
|-------------|---|---|
| INTRB 1.1.1 | Explain the aims and main objectives of the course. | 2 |
|-------------|---|---|

#### Subtopic INTRB 1.2 Course administration

|             |                              |   |
|-------------|------------------------------|---|
| INTRB 1.2.1 | State course administration. | 1 |
|-------------|------------------------------|---|

#### Subtopic INTRB 1.3 Study material and training documentation

|             |   |   |   |
|-------------|---|---|---|
| INTRB 1.3.1 | Use appropriate documentation and their sources for the course. | 3 | Optional content: Training documentation, library, CBT library, Web, Learning Management Server |
| INTRB 1.3.2 | Integrate appropriate information into course studies.          | 4 | Training documentation<br>Optional content: supplementary information, library                  |

### TOPIC INTRB 2 INTRODUCTION TO THE ATC TRAINING COURSE

#### Subtopic INTRB 2.1 Course content and organisation

|             |   |   |  |
|-------------|---|---|--|
| INTRB 2.1.1 | State the different training methods applied in the course. | 1 | Theoretical training, Practical training, Self-study, types of training events |
| INTRB 2.1.2 | State the subjects of the course and their purpose.         | 1 |  |
| INTRB 2.1.3 | Describe the organisation of theoretical training.          | 2 | Optional content: course programme   |
| INTRB 2.1.4 | Describe the organisation of practical training.            | 2 | Optional content: PTP, Simulation, Briefing, Debriefing, Course programme      |

#### Subtopic INTRB 2.2 Training ethos

|             |  |   |  |
|-------------|--|---|--|
| INTRB 2.2.1 | Recognise the feedback mechanisms available.   | 1 | Optional content: Instructor discussions, Training progress, Assessment, Examinations, Results, Briefing, Debriefing |
| INTRB 2.2.2 | Describe the positive effect of working and learning together with fellow-course participants. | 2 | Team work in theoretical and practical training  |

#### Subtopic INTRB 2.3 Assessment process

|             |                                  |   |
|-------------|----------------------------------|---|
| INTRB 2.3.1 | Describe the assessment process. | 2 |
|-------------|----------------------------------|---|

### TOPIC INTRB 3 INTRODUCTION TO THE ATCO'S FUTURE

#### Subtopic INTRB 3.1 Job prospects

|             |  |   |  |
|-------------|--|---|--|
| INTRB 3.1.1 | Recognise an ATCO's working environment. | 1 | Area control unit, approach control unit, aerodrome control unit   |
| INTRB 3.1.2 | Recognise career developments.           | 1 | <i>Optional content: OJT instructor, supervisor, operational managerial posts, non-operational posts</i> |

## Subject 2 : AVIATION LAW

The subject objective is:

Learners shall apply the regulations governing rules of the air, airspace and flight planning and explain their development **and or where applicable** incorporation into national legislation.

### TOPIC LAWB 1 INTRODUCTION TO AVIATION LAW

| Subtopic   | LAWB 1.1   | Relevance of aviation law | National and international organisations                                       |
|------------|--|---------------------------|--|
| LAWB 1.1.1 | State the necessity for air law, the sources and development of aviation law.              | 1                         | Optional content: Relevant EU legislation, ICAO Annex 2, National Aviation Law |
| LAWB 1.1.2 | Name the key national and international aviation organisations.                            | 1                         | Optional content: ICAO, ECAC, EASA, EUROCONTROL, National Authority            |
| LAWB 1.1.3 | Describe the impact these organisations have on ATC and their interaction with each other. | 2                         |  |

### TOPIC LAWB 2 INTERNATIONAL ORGANISATIONS

| Subtopic   | LAWB 2.1   | ICAO   |
|------------|--|--|
| LAWB 2.1.1 | Explain the purpose and function of ICAO.  | 2  |
| LAWB 2.1.2 | Describe the methods by which ICAO notifies and implements legislation.  | 2  |
|            |  | SARPs, PANS, ICAO Annexes, ICAO Documents<br>Optional content: <del>SARPs, PANS, ICAO Annexes, ICAO Documents</del> , regional offices |
| Subtopic   | LAWB 2.2   | European and other agencies  |
| LAWB 2.2.1 | Explain the purpose and functions of EUROCONTROL.  | 2  |
| LAWB 2.2.2 | Explain the purpose and functions of EASA.   | 2  |
| LAWB 2.2.3 | State the purpose and function of other international agencies and their relevance to air traffic operations.  | 1  |
| 2.2.1      |  | Optional content: ECAC, EU, <del>EASA</del> , ITU, <del>EUROCONTROL</del> , <del>SRG/SRU</del> , CANSO                                 |
| Subtopic   | LAWB 2.3   | Aviation associations  |
| LAWB 2.3.1 | State the purpose of controller, pilot, airline and airspace user associations and their interaction with ATC. | 1  |
|            |  | Optional content: IFATCA, IFALPA, IATA, AEA, IAOPA, IACA, military services, ETF, ATCEUC   |

### TOPIC LAWB 3 NATIONAL ORGANISATIONS

| Subtopic   | LAWB 3.1  | Purpose and function  |
|------------|---|---|
| LAWB 3.1.1 | Describe the purpose and function of appropriate national agencies and their relevance to air traffic operations. | 2   |
|            |   | Optional content: Civil aviation administration agencies, government agencies |
| Subtopic   | LAWB 3.2  | National legislative procedures   |

|   |   |   |  |
|---|---|---|--|
| LAWB 3.2.1  | Describe the means by which legislation is implemented, notified and updated.   | 2 | Relevant EU legislation<br><i>Optional content: ICAO Annex 15, AIS, AIPs, AICs, AIRAC SUP, NOTAMs, integrated aeronautical information package, national legislation, Letters of Agreement, operations manual</i>      |
| LAWB 3.2.2  | Recognise the information contained in the different parts of the AIP.  | 1 |  |
| <b>Subtopic    LAWB 3.3    Competent authority</b>                            |   |   |  |
| LAWB 3.3.1  | Name the competent authority responsible for licensing and enforcing legislation and operational procedures.                        | 1 |  |
| LAWB 3.3.2  | Describe how competent authority carries out its safety regulation responsibilities.  | 2 |  |
| <b>Subtopic    LAWB 3.4    National aviation associations</b>                 |   |   |  |
| LAWB 3.4.1  | State the purpose of national controller, pilot, airline and airspace user associations. <del>and their interaction with ATC.</del> | 1 |  |
| <b>TOPIC    LAWB 4    <del>ATS</del> SAFETY MANAGEMENT AND SAFETY CULTURE</b> |   |   |  |
| <b>Subtopic    LAWB 4.1    Safety regulation</b>                              |   |   |  |
| LAWB 4.1.1  | Describe the need for safety regulation.  | 2 | Regulation (EU) 216/2008<br><i>Optional content: National regulation</i>   |
| LAWB 4.1.2  | Describe the general principles of the safety organisation.   | 2 | Safety regulation<br><i>Optional content: Commission Implementing Regulation (EU) No 1035/2011, national regulation</i>  |
| LAWB 4.1.3  | Explain the impact of safety regulation on the controller.  | 2 | <i>Optional content: Commission Regulation (EU) on ATCO Licensing No xxx/yyyy <del>805/2011</del></i>  |
| <b>Subtopic    LAWB 4.2    Safety management system</b>                       |   |   |  |
| LAWB 4.2.1  | Explain how a safety management system complies with regulatory requirements.   | 2 | <del>Commission Implementing Regulation (EU) No 1035/2011</del>  |
| LAWB 4.2.1<br>4.2.1   | Explain the regulatory requirements of safety management systems in ATM.  | 2 | Commission Implementing Regulation (EU) No 1035/2011   |
| LAWB 4.2.2<br>4.2.1   | Explain the principles of the safety management systems.  | 2 | Commission Implementing Regulation (EU) No 1035/2011   |
| LAWB 4.2.3<br>4.2.2   | Describe the safety assessment methodology.   | 2 | Commission Implementing Regulation (EU) No 1035/2011, Commission Implementing Regulation (EU) No 1034/2011<br><i>Optional content: EATMP Air navigation system safety assessment methodology, national regulations</i> |

**TOPIC    LAWB 5    RULES AND REGULATIONS**

| <b>Subtopic    LAWB 5.1    Units of measurement</b>         |   |   |  |
|---|---|---|--|
| LAWB 5.1.1  | Describe the units of measurement used in aviation.                                       | 2 | ICAO Annex 5   |
| <b>Subtopic    LAWB 5.2    ATCO licensing/certification</b> |   |   |  |
| LAWB 5.2.1  | Explain the ATCO licensing/certification process.   | 2 | Commission Regulation (EU) <a href="#">on ATCO Licensing No xxx/yyyy</a> <del>No 805/2011</del> , Approved training courses, ATCO licence, ratings and endorsements<br><i>Optional content: national processes</i> |
| LAWB 5.2.2  | Explain the privileges and limitations of controller licences.                            | 2 | Commission Regulation (EU) <a href="#">on ATCO Licensing No. xxx/yyyy</a> <del>805/2011</del>  |
| <b>Subtopic    LAWB 5.3    Overview of ANS and ATS</b>      |   |   |  |
| LAWB 5.3.1  | Differentiate between the Air Navigation Services.  | 2 | ICAO Doc 9161  |
| LAWB 5.3.2  | Explain the considerations which determine the need for the ATS.                          | 2 | ICAO Annex 11  |
| LAWB 5.3.3  | Differentiate between the ATS.  | 2 | ATCS, ADVS, FIS, ALRS  |
| LAWB 5.3.4  | Explain the objectives of ATS.  | 2 | ICAO Annex 11  |
| <b>Subtopic    LAWB 5.4    Rules of the air</b>             |   |   |  |
| LAWB 5.4.1  | Explain the Rules of the Air.   | 2 | ICAO Annex 2   |
| LAWB 5.4.2  | State any notified differences with ICAO.   | 1 | <i>Optional content: ICAO Doc 7030, Supplements to ICAO Annex 2 and ICAO Annex 11</i>  |
| LAWB 5.4.3  | Appreciate the influence of relevant flight rules on ATC.                                 | 3 | General flight rules, instrument flight rules, visual flight rules   |
| LAWB 5.4.4  | Appreciate the differences between flying in accordance with VFR and IFR, in VMC and IMC. | 3 | ICAO Annex 2   |
| <b>Subtopic    LAWB 5.5    Airspace and ATS routes</b>      |   |   |  |
| LAWB 5.5.1  | Explain airspace classification.  | 2 | ICAO Classes A-G, ICAO Annex 11  |
| LAWB 5.5.2  | Differentiate between the different types of airspace.                                    | 2 | <i>Optional content: Control zones, control areas, airways, upper and lower airspace, restricted areas, prohibited and danger areas, FIR, aerodrome traffic zone, etc.</i>   |
| LAWB 5.5.3  | Differentiate between the different types of ATS routes.                                  | 2 | Airway, arrival route, departure route, advisory route, controlled route, uncontrolled route, etc.   |

|   |   |   |   |
|---|---|---|---|
| LAWB 5.5.4  | Decode information from aeronautical charts.                                  | 3 | <i>Optional content: Control zones, control areas, ATS routes, upper and lower airspace, restricted areas, prohibited and danger areas, FIR, aerodrome traffic zone, etc.</i>   |
| <b>Subtopic    LAWB 5.6    Flight plan</b>                        |   |   |   |
| LAWB 5.6.1  | Explain the functions of a flight plan.                                       | 2 | ICAO Doc 4444   |
| LAWB 5.6.2  | Explain the different types of flight plans and associated update messages.   | 2 | ICAO Doc 4444   |
| LAWB 5.6.3  | Explain the pilot's responsibilities in relation to adherence to flight plan. | 2 | Inadvertent changes, Intended changes, Position reporting   |
| LAWB 5.6.4  | Describe flight plan processing.  | 2 | <i>Optional content: AFTN, IFPS</i>   |
| 6.1.3 ATMB  |   |   |   |
| <b>Subtopic    LAWB 5.7    Aerodromes</b>                         |   |   |   |
| LAWB 5.7.1  | Describe the general design and layout of an aerodrome.                       | 2 | Runway(s), taxiways, apron, movement area, manoeuvring area, designated positions on an aerodrome   |
| LAWB 5.7.2  | Explain the numbering system and orientation of runways.                      | 2 | ICAO Annex 14   |
| LAWB 5.7.3  | Differentiate between different types of aerodromes.                          | 2 | Controlled, uncontrolled<br><i>Optional content: military, international, regional</i>  |
| LAWB 5.7.4  | Describe designated positions in the traffic circuit.                         | 2 |   |
| LAWB 5.7.5  | List the factors affecting the selection of runway in use.                    | 1 |   |
| <b>Subtopic    LAWB 5.8    Holding procedures for IFR Flights</b> |   |   |   |
| LAWB 5.8.1  | Describe the purpose of holding.  | 2 | Traffic management, weather, pilot request, ICAO Doc 4444, ICAO Doc 8168  |
| 5.8.3   |   |   |   |
| LAWB 5.8.2  | Describe types of holding patterns.   | 2 | Published, Non-published, Extended  |
| 5.8.1   |   |   |   |
| LAWB 5.8.3  | Describe an ICAO holding pattern.   | 2 | ICAO Doc 8168 - Parts of an IFR holding pattern, Entry/exit procedures, Dimensions of patterns, Protected airspace, Holding areas, Alignment, Rates of turns, Holding times, Expect further clearance, Expected Approach Times (EATs) |
| 5.8.4   |   |   |   |
| LAWB 5.8.4  | Describe the <del>use of</del> factors affecting holding pattern.             | 2 | Effect of speed, effect of level used, effect of navigation aid in use, turbulence, etc.  |
| 5.8.2   |   |   |   |
| <b>Subtopic    LAWB 5.9    Holding procedures for VFR flights</b> |   |   |   |



---

|                       |  |   |
|-----------------------|--|---|
| LAWB 5.9.1            | Describe <del>the purpose of</del> VFR holding.    | 2 |
| LAWB <del>5.9.2</del> | <del>Describe the principles of VFR holding.</del> | 2 |

---

### Subject 3 : AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall describe the basic principles of air traffic management and apply basic operational procedures.

#### TOPIC ATMB 1 AIR TRAFFIC MANAGEMENT

| Subtopic  | ATMB 1.1 Application of units of measurement   |  |
|---|--|--|
| ATMB 1.1.1  | Apply the units of measurement appropriate to ATM.                                     | 3  |
| Subtopic  | ATMB 1.2 Air traffic control (ATC) service   |  |
| ATMB 1.2.1  | Define ATC service.  | 1 ICAO Annex 11  |
| ATMB 1.2.2  | Explain the division of the ATC service.   | 2 ICAO Annex 11  |
| ATMB 1.2.3  | Explain the responsibility for the provision of the ATC service.                       | 2 ICAO Annex 11  |
| ATMB 1.2.4  | Differentiate between the different methods of <a href="#">providing</a> ATC services. | 2 Aerodrome, surveillance, procedural  |
| Subtopic  | ATMB 1.3 Flight information service (FIS)  |  |
| ATMB 1.3.1  | Define FIS.  | 1 ICAO Annex 11  |
| ATMB 1.3.2  | Describe the scope of the FIS.   | 2 ICAO Annex 11  |
| ATMB 1.3.3  | Explain the responsibility for the provision of the FIS.                               | 2 ICAO Doc 4444  |
| ATMB 1.3.4  | State the methods of transmitting information.   | 1 <i>Optional content: RTF, data link, ATIS, VOLMET, etc.</i>  |
| ATMB <a href="#">1.3.5</a>                          | <a href="#">List the content of ATIS and VOLMET.</a>                                   | 1 <a href="#">ICAO Annex 11, ICAO Annex 3</a><br><i>Optional content: meteorological data obtained by data link</i>  |
| ATMB <a href="#">1.3.6</a><br><a href="#">1.3.5</a> | Issue information to aircraft.   | 3 <i>Optional content: SIGMET, serviceability of nav aids, weather, flight safety information, essential traffic, essential local traffic, information related to aerodrome conditions, etc.</i> |
| Subtopic  | ATMB 1.4 Alerting service  |  |
| ATMB 1.4.1  | Define ALRS.   | 1 ICAO Doc 4444  |
| ATMB 1.4.2  | Describe the scope of the ALRS.  | 2 ICAO Annex 11  |
| ATMB 1.4.3  | Explain the responsibility for the provision of the ALRS.                              | 2 ICAO Doc 4444  |
| ATMB 1.4.4  | Differentiate between the phases of emergency.   | 2 Uncertainty, alert, distress   |
| ATMB 1.4.5  | Describe the organisation of an ALRS.  | 2 Responsibilities, local organisation   |

|  |   |   |   |
|--|---|---|---|
| ATMB 1.4.6   | Describe the cooperation between units providing the alerting services and the SAR units. | 2 |   |
| ATMB 1.4.7   | Differentiate between distress and urgency signals.                                       | 2 | Mayday, Pan Pan, Pan Pan Medical<br>Optional content: <del>Mayday, Pan</del> , visual signals, etc.   |
| <b>Subtopic ATMB 1.5 Air traffic advisory service</b>                        |   |   |   |
| ATMB 1.5.1   | Define Air Traffic Advisory Service.  | 1 | ICAO Annex 11   |
| ATMB 1.5.2   | Describe the scope of the Air Traffic Advisory Service.                                   | 2 | ICAO Doc 4444   |
| ATMB 1.5.3   | Explain the responsibility for the provision of the Air Traffic Advisory Service.         | 2 | ICAO Doc 4444   |
| ATMB 1.5.4   | State to which flights Air Traffic Advisory Service shall be provided.                    | 1 | ICAO Doc 4444   |
| <b>Subtopic ATMB 1.6 ATS system capacity and air traffic flow management</b> |   |   |   |
| ATMB 1.6.1   | Define ATFM.  | 1 | Commission Regulation (EU) No 549/2004  |
| ATMB 1.6.2   | State the scope of capacity management.   | 1 | ICAO Doc 4444 <del>ICAO Annex 11</del>  |
| ATMB 1.6.3   | Describe the scope of ATFCM.  | 2 | ICAO Doc 4444, EUROCONTROL ATFCM Users Manual<br>Optional content: <del>EUROCONTROL ATFCM Users Manual</del>  |
| ATMB 1.6.4   | Explain the responsibility for the provision of ATFCM.                                    | 2 | ICAO Doc 4444, EUROCONTROL ATFCM Users Manual<br>Optional content: <del>EUROCONTROL ATFCM Users Manual</del>  |
| ATMB 1.6.5   | <del>Explain</del> <del>State</del> the methods of providing ATFCM.                       | 2 | ICAO Doc 4444, EUROCONTROL ATFCM Users Manual<br>Optional content: <del>EUROCONTROL ATFCM Users Manual</del>  |
| <b>Subtopic ATMB 1.7 Airspace management (ASM)</b>                           |   |   |   |
| ATMB 1.7.1   | Define ASM.   | 1 | Commission Regulation (EU) No 549/2004<br>Optional content: Commission Regulation (EC) No 2150/2005, EUROCONTROL ASM HBK- Airspace Management Handbook for the application of FUA |
| ATMB 1.7.2   | Describe the scope of ASM.  | 2 | Optional content: FABs, EUROCONTROL ASM HBK- Airspace Management Handbook for the application of FUA  |
| ATMB 1.7.3   | Explain the responsibility for the provision of ASM.                                      | 2 | Optional content: EUROCONTROL ASM HBK- Airspace Management Handbook for the application of FUA  |

ATMB 1.7.4 **Explain State** the methods of managing airspace.

2 *Optional content: Flexible use of airspace, airspace design, CDRs, TSAs*

## TOPIC ATMB 2 ALTIMETRY AND LEVEL ALLOCATION

### Subtopic ATMB 2.1 Altimetry

ATMB 2.1.1 Appreciate the relationship between height, altitude and flight level.

3 QFE, QNH, standard pressure

### Subtopic ATMB 2.2 Transition level

ATMB 2.2.1 Appreciate the relationship between transition level, transition altitude and transition layer.

3 ICAO Doc 4444, ICAO Doc 8168

ATMB 2.2.2 Calculate appropriate levels.

3 *Optional content: Transition level, transition layer, height, lowest useable flight level, vertical distance to airspace boundaries*

### Subtopic ATMB 2.3 Level allocation

ATMB 2.3.1 Describe the cruising level allocation system.

2 ICAO Annex 2, tables of cruising levels

ATMB 2.3.2 Choose appropriate levels.

3 Flight levels, altitudes, heights

## TOPIC ATMB 3 RADIOTELEPHONY (RTF)

### Subtopic ATMB 3.1 RTF general operating procedures

ATMB 3.1.1 Explain the need for approved phraseology.

2

ATMB 3.1.2 Use approved phraseology.

3 Parts of the following documents relevant to the Basic course: ICAO Doc 4444, ICAO Doc 9432 RTF manual - standard words and phrases, ICAO Annex 10 Vol. 2

ATMB 3.1.3 Perform communication effectively.

3 Communication techniques  
Readback/verification of readback

## TOPIC ATMB 4 ATC CLEARANCES AND ATC INSTRUCTIONS

### Subtopic ATMB 4.1 Type and content of ATC clearances

ATMB 4.1.1 Define ATC clearance.

1 ICAO Annex 2

ATMB 4.1.2 Describe the contents of an ATC clearance.

2 ICAO Doc 4444, ICAO Annex 11

ATMB 4.1.3 Issue appropriate ATC clearances.

3 ICAO Doc 4444  
*Optional content: national documents*

### Subtopic ATMB 4.2 ATC instructions

ATMB 4.2.1 Define ATC Instructions.

1 ICAO Doc 4444

ATMB 4.2.2 Describe the contents of an ATC instructions.

2 ICAO Doc 4444, ICAO Annex 11

ATMB 4.2.3 Issue appropriate ATC instructions.

3 ICAO Doc 4444

*Optional content: national documents***TOPIC ATMB 5 COORDINATION****Subtopic ATMB 5.1 Principles, types and content of coordination**

ATMB 5.1.1 Explain the principles, types and content of coordination.

2 ICAO Doc 4444, ICAO Annex 11

*Optional content: notification, negotiation, agreement, transfer of flight data and local agreements, etc.***Subtopic ATMB 5.2 Necessity for coordination**

ATMB 5.2.1 Appreciate the need for coordination.

3 *Optional content: ICAO Doc 4444, Local procedures, Letters of agreement*

ATMB 5.2.2 Differentiate between transfer of control and transfer of communication procedures.

2

**Subtopic ATMB 5.3 Means of coordination**

ATMB 5.3.1 Describe the means of coordination

2 *Optional content: Data link, telephone, intercom, voice, etc.*

ATMB 5.3.2 Use the available means for coordination.

3

**TOPIC ATMB 6 DATA DISPLAY****Subtopic ATMB 6.1 Data extraction**

ATMB 6.1.1 Encode and decode an appropriate selection of standard ICAO abbreviations.

3 *Optional content: ICAO Doc 8585, ICAO Doc 8643, ICAO Doc 7910*

ATMB 6.1.2 Extract pertinent data from relevant sources to produce a flight progress display.

3 Pilot reports, coordination, data exchange  
*Optional content: flight plan*ATMB ~~6.1.3~~ Describe flight plan processing.  
5.6.4 LAWB2 ~~Optional content: AFTN, IFPS~~ATMB 6.1.3 Encode and decode flight plans (including supplementary information).  
6.1.4

3 ICAO format, AFTN format

**Subtopic ATMB 6.2 Data management**

ATMB 6.2.1 Update the situation display to accurately reflect the traffic situation.

3 *Optional content: Strip marking symbols, strip movement procedures, electronic data, label***TOPIC ATMB 7 SEPARATIONS****Subtopic ATMB 7.1 Vertical separation and procedures** ~~Data extraction~~

ATMB 7.1.1 State the vertical separation standards and procedures.

1 ICAO Doc 4444

ATMB 7.1.2 Explain the vertical separation procedures.

2 ICAO Doc 4444

**Subtopic ATMB 7.2 Horizontal separation and procedures**

|   |  |   |  |
|---|--|---|--|
| ATMB 7.2.1  | State the longitudinal separation standards and procedures based on time and distance.                               | 1 | ICAO Doc 4444  |
| ATMB 7.2.2  | State the lateral separation standards and procedures.   | 1 | ICAO Doc 4444  |
| <b>Subtopic ATMB 7.3 Visual separation</b>  |  |   |  |
| ATMB 7.3.1  | State the occasions when clearance to fly maintaining own separation while in VMC can be used.                       | 1 |  |
| <b>Subtopic ATMB 7.4 Aerodrome separation and procedures</b>                          |  |   |  |
| ATMB 7.4.1<br>7.5.1   | State the aerodrome separation standards. <del>and procedures.</del>   | 1 | Separation on the manoeuvring area, in the traffic circuit, for departing and arriving aircraft  |
| ATMB 7.4.2  | Explain the aerodrome separation procedures.   | 2 | ICAO Doc 4444  |
| ATMB 7.4.3  | Define essential local traffic.  | 1 | ICAO Doc 4444  |
| <b>Subtopic ATMB 7.5 Separation based on ATS surveillance systems</b>                 |  |   |  |
| ATMB 7.5.1<br>7.6.1   | Explain the use of ATS surveillance systems in ATS.  | 2 | Separation, identification, monitoring, vectoring, expedition and assistance to traffic<br><i>Optional content: ICAO Doc 4444</i>              |
| ATMB 7.5.2<br>7.6.2   | Explain the ATS surveillance systems separation standards and procedures.  | 2 |  |
| <b>Subtopic ATMB 7.6 Wake turbulence separation</b>                                   |  |   |  |
| ATMB 7.6.1<br>7.4.1   | Explain the wake turbulence <del>categories</del> <del>and</del> separations.  | 2 | ICAO Doc 4444  |
| <b>Subtopic ATMB 7.7 <del>Applied separation</del></b>                                |  |   |  |
| ATMB 7.7.1<br>9.2.10  | Apply separation:  | 3 | <del>Optional content: vertical, longitudinal, lateral, aerodrome, based on ATS surveillance systems, distances from airspace boundaries</del> |
| <b>TOPIC ATMB 8 AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS</b> |  |   |  |
| <b>Subtopic ATMB 8.1 Airborne collision avoidance systems</b>                         |  |   |  |
| ATMB 8.1.1  | State the European requirement for carriage of airborne collision avoidance system.                                  | 1 | Relevant EU legislation<br><i>Optional content: Commission Regulation (EU) 1332/2011</i>   |
| ATMB 8.1.2<br>8.1.1   | Explain <del>State</del> the main characteristics of airborne warning systems and their relevance to ATC operations. | 2 | ACAS, TAWS<br><i>Optional content: <del>ACAS GPWS</del>, TCAS, EGPWS, Wind shear alerts</i>  |
| ATMB 8.1.3<br>8.1.2   | Explain <del>State</del> the function of ACAS Traffic Alerts and Resolution Advisories.                              | 2 | ICAO Doc 8168  |

|   |  |   |   |
|---|--|---|---|
| ATMB 8.1.4<br>8.1.3   | List , <del>in the correct order,</del> the actions of the pilot <del>following the</del> in case of TA and RA. <del>generation of ACAS event.</del> | 1 | Commission Regulation (EU) No 1332/2011<br>ICAO Doc 8168  |
| ATMB 7.1.4<br>8.1.4<br>7.1.2 R  | <del>Describe the controller responsibility during and following an ACAS RA reported by pilot.</del>   | 2 | <del>ICAO Doc 4444</del>  |
| ATMB 8.1.5  | List the ACAS limitations.   | 1 | ICAO Doc 9863   |
| ATMB 7.1.6<br>8.1.6<br>7.1.1 R  | <del>Differentiate between ACAS advisory thresholds and ATC separation standards.</del>  | 2 | <del>ICAO Doc 9863</del>  |
| <b>Subtopic ATMB 8.2 Ground-based safety nets</b>                         |  |   |   |
| ATMB 8.2.1  | Explain <del>State</del> the main characteristics of ground-based safety nets and their relevance to ATC operations.                                 | 2 | Optional content: STCA, MSAW, APW, APM  |
| <b>TOPIC ATMB 9 BASIC PRACTICAL SKILLS</b>                                |  |   |   |
| <b>Subtopic ATMB 9.1 Traffic management process</b>                       |  |   |   |
| ATMB 9.1.1  | Consider human information processing in the provision of ATC.   | 2 | situational awareness, conflict detection, planning, decision making, prioritisation, execution                                     |
| ATMB 9.1.2  | Consider the need for verification that actions are carried out.   | 2 | Monitoring  |
| <b>Subtopic ATMB 9.2 Basic practical skills applicable to all ratings</b> |  |   |   |
| ATMB 9.2.1  | Verify that settings of the working position are appropriate.  | 3 |   |
| ATMB 9.2.2  | Operate the available working position equipment.  | 3 |   |
| ATMB 9.2.3  | Maintain situational awareness by monitoring traffic.  | 3 | information gathering, scanning, planning   |
| ATMB 9.2.4  | Appreciate priority of actions.  | 3 |   |
| ATMB 9.2.5  | Execute selected plan.   | 3 |   |
| ATMB 9.2.6  | Apply the prescribed procedures for the area of responsibility.  | 3 | Optional content: LOPs, transfer of control and communication, level allocation, inbound and outbound procedures                    |
| ATMB 9.2.7  | Appreciate relative velocity between aircraft.   | 3 |   |
| ATMB 9.2.8  | Identify separation problems.  | 3 |   |
| ATMB 9.2.9  | Choose appropriate separation methods.   | 3 |   |
| ATMB 9.2.10<br>7.7.1  | Apply separation.  | 3 | Optional content: vertical, longitudinal, lateral, aerodrome, based on ATS surveillance systems, distances from airspace boundaries |

| Subtopic ATMB 9.3 Basic practical skills applicable to aerodrome    |  |   |  |
|---|--|---|--|
| ATMB 9.3.1  | Perform the basic functions of aerodrome control.                        | 3 |  |
| ATMB 9.3.2  | Perform the control of aerodrome traffic.                                | 3 | single runway operations including VFR and IFR traffic   |
| Subtopic ATMB 9.4 Basic practical skills applicable to surveillance |  |   |  |
| ATMB 9.4.1  | Explain the methods and procedures of establishing identification.       | 2 | ICAO Doc 4444  |
| 12.1.1 R  |  |   | <del>Optional content: PSR</del>   |
| ATMB 9.4.2  | Apply the procedures of establishing identification.                     | 3 | Any of the ATS Surveillance systems identification methods   |
| 12.1.2 R  |  |   |  |
| ATMB 9.4.3  | Estimate heading for a new track and the distance to the next way point. | 3 |  |
| ATMB 9.4.4  | Apply vectoring techniques.  | 3 |  |
| ATMB 9.4.5  | Conduct level changes.   | 3 | Optional content: cruising level allocation, requested level change, climb/descent to exit level, descent to an altitude or a height |



## Subject 4 : METEOROLOGY

The subject objective is:

Learners shall describe how meteorology affects ATS operations and aircraft performance and apply meteorological information in the basic operational procedures of ATS.

### TOPIC METB 1 INTRODUCTION TO METEOROLOGY

| Subtopic METB 1.1 Application of units of measurement    |  |   |   |
|--|--|---|---|
| METB 1.1.1   | Apply the units of measurement appropriate to meteorology.   | 3 |   |
| Subtopic METB 1.2 Aviation and meteorology               |  |   |   |
| METB 1.2.1   | Explain the relevance of meteorology in aviation.  | 2 |   |
| METB 1.2.2   | Explain the requirements for the provision of meteorological information available to operators, flight crew members, and to air traffic services. | 2 | ICAO Annex 3, ICAO Annex 11   |
| METB 1.2.3   | State the meteorological hazards to aviation.  | 1 | Turbulence, thunderstorms, icing, micro bursts, squall, macro burst, wind shear |
| Subtopic METB 1.3 Organisation of meteorological service |  |   |   |
| METB 1.3.1   | Name the basic duties, organisation and working methods of meteorological offices.   | 1 | Optional content: WAFS, WAFC, MWO, VAAC, TCAC, SADIS                            |
| METB 1.3.2   | State the International and National standards for coordination between ATS and MET services.  | 1 |   |

### TOPIC METB 2 ATMOSPHERE

| Subtopic METB 2.1 Composition and structure |   |   |  |
|---|---|---|--|
| METB 2.1.1                                  | State the composition and structure <del>Gases, layers</del> of the atmosphere. | 1 | Gases, layers  |
| METB 2.1.2                                  | Describe the basic characteristics of the atmospheric parameters measured.      | 2 | Temperature, pressure, wind, humidity, density   |
| METB 2.1.3                                  | List the tools used for the collection of meteorological data.                  | 1 | Optional content: Barometer, thermometer, ceilometer, anemometer, weather balloons, transmissometer, radar, satellites, etc. |
| Subtopic METB 2.2 Standard atmosphere       |   |   |  |
| METB 2.2.1                                  | Describe the elements of the ISA.   | 2 | Temperature, pressure, density   |
| METB 2.2.2                                  | State the reasons why the ISA has been defined.                                 | 1 |  |
| Subtopic METB 2.3 Heat and temperature      |   |   |  |

|   |   |   |   |
|---|---|---|---|
| METB 2.3.1  | Define the processes by which heat is transferred and how the atmosphere is heated.                         | 1 | Radiation, convection, advection, conduction, Water Cycle   |
| METB 2.3.2  | Describe how temperature varies.  | 2 | Adiabatic processes, lapse rates, stability, <i>instability</i>   |
| METB 2.3.3  | <i>State the influencing factors on surface temperature.</i>  | 1 |   |
| <b>Subtopic METB 2.4 Water in the atmosphere</b>        |   |   |   |
| METB 2.4.1  | Differentiate between the different processes related to atmospheric moisture.                              | 2 | Condensation, evaporation, sublimation, saturation  |
| METB 2.4.2  | Characterise relative humidity, dew point and latent heat.  | 2 |   |
| <b>Subtopic METB 2.5 Air pressure</b>                   |   |   |   |
| METB 2.5.1  | Describe the relationship between pressure, temperature, density and height.                                | 2 |   |
| METB 2.5.2  | Explain the relationship between pressure settings.   | 2 | QFE, QNH, standard pressure   |
| METB 2.5.3  | Explain the effect of air pressure and temperature on altimeter readings and the true altitude of aircraft. | 2 |   |
| METB 2.5.4  | <i>State how atmospheric pressure is measured.</i>  | 1 |   |
| <b>TOPIC METB 3 ATMOSPHERIC CIRCULATION</b>             |   |   |   |
| <b>Subtopic METB 3.1 General air circulation</b>        |   |   |   |
| METB 3.1.1  | State the major atmospheric circulation features on the Earth.  | 1 | <i>Optional content: Hadley cells, high and low belts, polar fronts, westerly winds, upper level jet streams</i>  |
| <b>Subtopic METB 3.2 Air masses and frontal systems</b> |   |   |   |
| METB 3.2.1  | Describe the origin and movement of typical air masses and their general effect on European weather.        | 2 | Polar, arctic, tropical, equatorial (maritime and continental)  |
| METB 3.2.2  | Describe the main isobaric features.  | 2 | Cyclones, anticyclones, ridge, trough   |
| METB 3.2.3  | Describe the difference between various fronts and the associated weather.                                  | 2 | Warm front, cold front, occluded front  |
| <b>Subtopic METB 3.3 Mesoscale systems</b>              |   |   |   |
| METB 3.3.1  | Describe the main phenomena caused by mesoscale systems.  | 2 | Mountain waves, Föhn, Slope and valley winds, thunderstorm, squall line<br><i>Optional content: land/sea breezes, tornadoes, land spouts, waterspouts</i> |

|   |  |   |  |
|---|--|---|--|
| METB 3.3.2                                      | Explain State the relevance of mesoscale systems to aviation.                  | 2 |  |
| <b>Subtopic METB 3.4 Wind</b>                   |  |   |  |
| METB 3.4.1                                      | Explain the significance of wind phenomena and types.                          | 2 | Optional content: veering, backing, gusting, jet streams, land/sea breezes, Föhn, surface, upper |
| METB 3.4.2                                      | State how wind is measured.  | 1 |  |
| METB 3.4.3                                      | Explain effect of forces which influence wind.                                 | 2 |  |
| <b>TOPIC METB 4 METEOROLOGICAL PHENOMENA</b>    |  |   |  |
| <b>Subtopic METB 4.1 Clouds</b>                 |  |   |  |
| METB 4.1.1                                      | Explain the different conditions for the formation of clouds.                  | 2 |  |
| METB 4.1.2                                      | Recognise different cloud types.   | 1 |  |
| METB 4.1.3                                      | State the cloud types main characteristics.                                    | 1 |  |
| METB 4.1.4                                      | State how the cloud base and the amount of cloud are measured and/or observed. | 1 |  |
| METB 4.1.5                                      | Define cloud base and ceiling.   | 1 |  |
| METB 4.1.6                                      | Differentiate between cloud base and ceiling.                                  | 2 |  |
| <b>Subtopic METB 4.2 Types of precipitation</b> |  |   |  |
| METB 4.2.1                                      | Explain the significance of precipitation in aviation.                         | 2 |  |
| METB 4.2.2                                      | Describe types of precipitation and their corresponding cloud families.        | 2 | Optional content: Rain, snow, snow grains, hail, ice pellets, ice crystals, drizzle              |
| <b>Subtopic METB 4.3 Visibility</b>             |  |   |  |
| METB 4.3.1                                      | Explain the causes of atmospheric obscurity.                                   | 2 |  |
| METB 4.3.2                                      | Differentiate between different types of visibility.                           | 2 | Horizontal visibility, slant visibility, prevailing visibility, RVR                              |
| METB 4.3.3                                      | State how visibility is measured.  | 1 |  |
| METB 4.3.4                                      | Explain the significance of visibility in aviation.                            | 2 |  |
| <b>Subtopic METB 4.4 Meteorological hazards</b> |  |   |  |

|   |  |   |  |
|---|--|---|--|
| METB 4.4.1  | Explain the meteorological hazards to aviation.            | 2 | Turbulence, icing, micro bursts, macro burst, wind shear<br><i>Optional content: thunderstorms, squall</i> |
| METB 4.4.2<br>4.4.1   | Describe the effect of meteorological hazards on aviation. | 2 |  |
| <b>TOPIC METB 5 METEOROLOGICAL INFORMATION FOR AVIATION</b> |  |   |  |
| <b>Subtopic</b>   | <b>METB 5.1 Messages and reports</b>                       |   |  |
| METB 5.1.1  | Decode the content of weather reports and forecasts.       | 3 | METAR, SPECI, TAF, SIGMET<br><i>Optional content: local reports</i>  |

## Subject 5 : NAVIGATION

The subject objective is:

Learners shall explain the basic principles of navigation and use this knowledge in ATS operations.

### TOPIC NAVB 1 INTRODUCTION TO NAVIGATION

#### Subtopic NAVB 1.1 Application of units of measurement

|            |   |   |
|------------|---|---|
| NAVB 1.1.1 | Apply the units of measurement appropriate to navigation. | 3 |
|------------|---|---|

#### Subtopic NAVB 1.2 Purpose and use of navigation

|            |  |  |
|------------|--|--|
| NAVB 1.2.1 | Explain the need for navigation in aviation. | 2  |
| NAVB 1.2.2 | Characterise navigation methods.             | 2 <i>Optional content: Historical overview, celestial, on-board, radio, satellites</i> |

### TOPIC NAVB 2 THE EARTH

#### Subtopic NAVB 2.1 Place and movement of the Earth

|            |   |   |
|------------|---|---|
| NAVB 2.1.1 | Explain the Earth's properties and their effects. | 2 <i>Optional content: Form, size, rotation, revolution in space, seasons, day, night, twilight, units of time, time zones, UTC</i> |
|------------|---|---|

#### Subtopic NAVB 2.2 System of coordinates, direction and distance

|            |   |   |
|------------|---|---|
| NAVB 2.2.1 | Characterise the general principles of a grid system. | 2 <i>Optional content: Degrees, minutes, seconds, WGS-84, latitude/longitude</i>                          |
| NAVB 2.2.2 | Explain direction and distance on a globe.            | 2 <i>Optional content: Great circle, small circle, rhumb line, cardinal points, inter-cardinal points</i> |
| NAVB 2.2.3 | Estimate position on the Earth's surface.             | 3 <i>Optional content: Latitude/longitude</i>   |
| NAVB 2.2.4 | Estimate distance and direction between two points.   | 3   |

#### Subtopic NAVB 2.3 Magnetism

|            |   |   |
|------------|---|---|
| NAVB 2.3.1 | Explain the general principles of the Earth's magnetism.    | 2 True north, magnetic north, variation, deviation, inclination |
| NAVB 2.3.2 | Calculate conversions between the three north designations. | 3 True north, magnetic north, compass north                     |

### TOPIC NAVB 3 MAPS AND AERONAUTICAL CHARTS

#### Subtopic NAVB 3.1 Map making and projections

|            |   |  |
|------------|---|--|
| NAVB 3.1.1 | State how the Earth is projected to create a map. | 1 Types of projection  |
| NAVB 3.1.2 | Describe the properties of a map.                 | 2 Projection, scale  |
| NAVB 3.1.3 | Describe the properties of an ideal map.          | 2 <i>Optional content: Conformality, constant scale, true azimuth, rhumb lines and great circles</i> |

|   |  |   |  |
|---|--|---|--|
| NAVB 3.1.4  | State Explain the properties and use of                      | 1 | Optional content: Lambert, Mercator, stereographic             |
| 3.1.3   | different projections.                                       |   |  |
| <b>Subtopic NAVB 3.2 Maps and charts used in aviation</b> |  |   |  |
| NAVB 3.2.1  | Differentiate between the various maps and charts.           | 2 |  |
| NAVB 3.2.2  | State the specific use of various maps and charts.           | 1 |  |
| NAVB 3.2.3  | Decode symbols and information displayed on maps and charts. | 3 | Optional content: topographical features, NAV aids, fixes etc. |

## TOPIC NAVB 4 NAVIGATIONAL BASICS

|  |   |   |   |
|--|---|---|---|
| <b>Subtopic NAVB 4.1 Influence of wind</b>                       |   |   |   |
| NAVB 4.1.1   | Appreciate the influence of wind on the flight path.                      | 3 | Heading, track, drift, wind vector  |
| <b>Subtopic NAVB 4.2 Speed</b>                                   |   |   |   |
| NAVB 4.2.1   | Explain the relationship between various speeds used in aviation.         | 2 | True air speed, ground speed, indicated air speed (including Mach number)   |
| NAVB 4.2.2   | Appreciate the use of various speeds in ATC.                              | 3 |   |
| <b>Subtopic NAVB 4.3 Visual navigation</b>                       |   |   |   |
| NAVB 4.3.1   | Differentiate Explain between the different methods of visual navigation. | 2 | Map reading, visual reference<br>Optional content: dead-reckoning           |
| <b>Subtopic NAVB 4.4 Navigational aspects of flight planning</b> |   |   |   |
| NAVB 4.4.1   | Describe the navigational aspects affecting flight planning.              | 2 | Optional content: fuel/time calculations, min altitudes, alternative routes |

## TOPIC NAVB 5 INSTRUMENTAL NAVIGATION

|   |   |   |  |
|---|---|---|--|
| <b>Subtopic NAVB 5.1 Ground-based systems</b>                 |   |   |  |
| NAVB 5.1.1  | Explain the basic working principles of ground-based systems.                           | 2 | VDF, NDB, VOR, DME, ILS<br>Optional content: TACAN, MLS  |
| NAVB 5.1.2  | State the use of ground-based systems.  | 1 | VDF, NDB, VOR, DME, ILS<br>Optional content: TACAN, MLS  |
| NAVB 5.1.3  | Characterise the main radio navigation techniques based on ground-based systems.        | 2 | Optional content: homing, inbound/outbound tracking, instrument approach procedures, holding, drift assessment |
| NAVB 5.1.4  | Explain the effects of precision and limitations of ground-based systems on the flight. | 2 | VDF, NDB, VOR, DME, ILS<br>Optional content: TACAN, MLS  |
| <b>Subtopic NAVB 5.2 Inertial navigation On-board systems</b> |   |   |  |

|   |  |   |   |
|---|--|---|---|
| NAVB 5.2.1  | Explain the basic working principles, <b>precision and limitations</b> of on-board systems.                                      | 2 | <i>Optional content: INS/IRS</i>  |
| NAVB 5.2.2  | State the use of on-board systems.   | 1 |   |
| NAVB 5.2.3<br>5.2.1   | <del>Explain the effects of precision and limitations of on-board systems.</del>   | 2 |   |
| <b>Subtopic NAVB 5.3 Satellite-based systems</b>                    |  |   |   |
| NAVB 5.3.1  | Explain the basic working principles of positioning systems.   | 2 | <i>Optional content: GPS, GLONASS, Galileo</i>  |
| NAVB 5.3.2  | State the basic principles of GNSS concept.  | 1 | Basic, ABAS, SBAS, GBAS   |
| NAVB 5.3.3  | <b>Explain State</b> the effects of precision and limitations of satellite-based systems.  | 2 | <i>Optional content: RAIM, GPS Notams</i>   |
| <b>Subtopic NAVB 5.4 Instrument approach procedures</b>             |  |   |   |
| NAVB 5.4.1  | Recognise various types of instrument approach using aeronautical charts.  | 1 |   |
| NAVB 5.4.2  | Differentiate between precision approach and non-precision approach procedures.  | 2 |   |
| NAVB 5.4.3  | Recognise the different minima used during an instrument approach.   | 1 |   |
| NAVB 5.4.4  | Define the terms obstacle clearance altitude/height and minimum descent altitude/height.   | 1 |   |
| NAVB 5.4.5  | List the instrument approach fixes.  | 1 | IAF, IF, FAF, FAP, MAPt   |
| <b>TOPIC NAVB 6 PERFORMANCE BASED <del>AREA</del> NAVIGATION</b>    |  |   |   |
| <b>Subtopic NAVB 6.1 Principles and benefits of area navigation</b> |  |   |   |
| NAVB 6.1.1  | Explain the basic principles of area navigation.   | 2 | <i>Optional content: ICAO Doc 9613</i>  |
| NAVB 6.1.2  | State the benefits of area navigation.   | 1 | <i>Optional content: ICAO Doc 9613</i>  |
| NAVB 6.1.3  | State the effects of navigational performance accuracy of RNAV systems on the flight.  | 1 | TSE, PDE, NSE, FTE<br><i>Optional content: ICAO Doc 9613</i>  |
| NAVB 6.1.4<br>6.2.2   | Characterise the main aircraft and avionics functionalities <del>navigational techniques based on</del> used in area navigation. | 2 | <i>Optional content: way points transitions (FRT) and path terminators (including RF), fly over and fly by a way point, parallel offset</i> |
| NAVB 6.1.5<br>6.2.3   | Characterise the navigational functions of FMS.  | 2 | <i>Optional content: VNAV, LNAV</i>   |
| <b>Subtopic NAVB 6.2 Introduction to PBN</b>                        |  |   |   |
| NAVB 6.2.1  | State the general concept of PBN.  | 1 | <i>Optional content: ICAO Doc 9613</i>  |

|   |  |   |  |
|---|--|---|--|
| NAVB 6.2.2  | Differentiate between RNAV and RNP.  | 2 | On board performance monitoring and alerting   |
| NAVB 6.2.3  | State the navigation infrastructure that may be used in PBN.                 | 1 | VOR, DME, GNSS<br><i>Optional content: functionality IRS/INS</i>   |
| NAVB 6.2.4  | State the benefits of PBN concept.   | 1 | <i>Optional content: global interoperability, limited number of navigation specifications</i>                                      |
| NAVB 6.2.4<br>6.2.4   | <del>List the types of RNP.</del>  | 1 |  |
| <b>Subtopic NAVB 6.3 PBN applications <del>Types and techniques</del></b> |  |   |  |
| NAVB 6.3.1<br>6.2.1   | List the navigation applications in use in Europe. <del>types of RNAV.</del> | 1 | En-route, Terminal/Approach<br><i>Optional content: RNAV-5 (B-RNAV), RNAV-1 (<math>\approx</math> P-RNAV), <del>RNP-RNAV</del></i> |
| <b>TOPIC NAVB 7 DEVELOPMENTS IN NAVIGATION</b>                            |  |   |  |
| <b>Subtopic NAVB 7.1 Future <del>New</del> developments</b>               |  |   |  |
| NAVB 7.1.1<br>6.3.1   | State <del>Name new</del> future developments in <del>area</del> navigation. | 1 | <del>PBN, etc.</del>   |



**Subject 6 : AIRCRAFT**

The subject objective is:

Learners shall describe the basic principles of the theory of flight and aircraft characteristics and how these influence ATS operations.

**TOPIC ACFTB 1 INTRODUCTION TO AIRCRAFT****Subtopic ACFTB 1.1 Application of units of measurement**

|             |  |   |
|-------------|--|---|
| ACFTB 1.1.1 | Apply the units of measurement appropriate to aircraft and principles of flight. | 3 |
|-------------|--|---|

**Subtopic ACFTB 1.2 Aviation and aircraft**

|             |   |   |
|-------------|---|---|
| ACFTB 1.2.1 | Explain the relevance of theory of flight and aircraft characteristics in ATS operations. | 2 |
|-------------|---|---|

**TOPIC ACFTB 2 PRINCIPLES OF FLIGHT****Subtopic ACFTB 2.1 Forces acting on aircraft**

|             |   |   |  |
|-------------|---|---|--|
| ACFTB 2.1.1 | Explain the forces acting on an aircraft in flight and their interaction. | 2 | Lift, thrust, drag, weight during level flight<br><i>Optional content: during climb, descent, turn</i> |
|-------------|---|---|--|

|             |  |   |              |
|-------------|--|---|--------------|
| ACFTB 2.1.2 | Explain causes and effects of wake turbulence. | 2 | Induced drag |
|-------------|--|---|--------------|

**Subtopic ACFTB 2.2 Structural components and control of an aircraft**

|             |   |   |  |
|-------------|---|---|--|
| ACFTB 2.2.1 | <del>List</del> Describe the main structural components of an aircraft. | 2 | Rotary and fixed wing, tail plane, fuselage, flap, aileron, elevator, rudder, landing gear |
| ACFTB 2.2.2 | Explain how the pilot controls the movements of an aircraft.            | 2 | <i>Optional content: rudder, aileron, elevator, throttle, rotary wing controls</i>         |
| ACFTB 2.2.3 | Explain the factors affecting aircraft stability.                       | 2 |  |

**Subtopic ACFTB 2.3 Flight envelope**

|             |  |   |  |
|-------------|--|---|--|
| ACFTB 2.3.1 | Characterise the critical factors which affect aircraft performance. | 2 | Maximum speeds, minimum and stall speeds, ceiling, critical angle of attack, maximum ROC |
|-------------|--|---|--|

**TOPIC ACFTB 3 AIRCRAFT CATEGORIES****Subtopic ACFTB 3.1 Aircraft categories**

|             |  |   |   |
|-------------|--|---|---|
| ACFTB 3.1.1 | List the different categories of aircraft. | 1 | <i>Optional content: Fixed wing, rotary wing, balloon, glider</i> |
|-------------|--|---|---|

**Subtopic ACFTB 3.2 Wake turbulence categories**

|             |                                      |   |                                 |
|-------------|--------------------------------------|---|---------------------------------|
| ACFTB 3.2.1 | List the wake turbulence categories. | 1 | ICAO wake turbulence categories |
|-------------|--------------------------------------|---|---------------------------------|

**Subtopic ACFTB 3.3 ICAO approach categories**

|   |   |   |  |
|---|---|---|--|
| ACFTB 3.3.1   | List the ICAO approach categories.  | 1 | ICAO Doc 8168  |
| <b>Subtopic ACFTB 3.4 Environmental categories</b>    |   |   |  |
| ACFTB 3.4.1   | List ICAO noise classification.   | 1 | ICAO Annex 16  |
| <b>TOPIC ACFTB 4 AIRCRAFT DATA</b>                    |   |   |  |
| <b>Subtopic ACFTB 4.1 Recognition</b>                 |   |   |  |
| ACFTB 4.1.1   | Recognise the most commonly used aircraft.  | 1 |  |
| <b>Subtopic ACFTB 4.2 Performance data</b>            |   |   |  |
| ACFTB 4.2.1   | State the ICAO aircraft type designators and categories for the most commonly used aircraft.                  | 1 | Type designators, approach and wake turbulence categories  |
| ACFTB 4.2.2   | State the standard average performance data of the most commonly used aircraft.                               | 1 | Rate of climb/descent, cruising speed, ceiling   |
| <b>TOPIC ACFTB 5 AIRCRAFT ENGINES</b>                 |   |   |  |
| <b>Subtopic ACFTB 5.1 Piston engines</b>              |   |   |  |
| ACFTB 5.1.1   | Explain the operating principles, advantages and disadvantages of the piston engine and propeller.            | 2 | Piston engines, fixed pitch, variable pitch, number of blades  |
| <b>Subtopic ACFTB 5.2 Jet engines</b>                 |   |   |  |
| ACFTB 5.2.1   | Explain the operating principles, advantages and disadvantages of the jet engine.                             | 2 |  |
| ACFTB 5.2.2   | List the different types of jet engines.  | 1 |  |
| <b>Subtopic ACFTB 5.3 Turboprop engines</b>           |   |   |  |
| ACFTB 5.3.1   | Explain the operating principles, advantages and disadvantages of the turboprop engine and propeller.         | 2 |  |
| <b>Subtopic ACFTB 5.4 Aviation fuels</b>              |   |   |  |
| ACFTB 5.4.1   | List the most common aviation fuels.  | 1 |  |
| <b>TOPIC ACFTB 6 AIRCRAFT SYSTEMS AND INSTRUMENTS</b> |   |   |  |
| <b>Subtopic ACFTB 6.1 Flight instruments</b>          |   |   |  |
| ACFTB 6.1.1   | Explain the basic operating principles and interpretation of the information displayed by flight instruments. | 2 | Altimeter, air speed indicator, vertical speed indicator, turn and bank indicator, artificial horizon, gyrosyn compass |
| ACFTB 6.1.2   | Explain the impact of errors and abnormal indications of flight instruments on aircraft operations.           | 2 | Optional content: Pitot-static failures, unreliable gyro source  |
| <b>Subtopic ACFTB 6.2 Navigational instruments</b>    |   |   |  |

|  |   |   |  |
|--|---|---|--|
| ACFTB 6.2.1  | Describe the basic on-board operating principles and interpretation of the information displayed by navigational instruments/systems. | 2 | <i>Optional content: ADF, VOR (TACAN), DME, ILS, MLS, inertial reference system, satellite-based systems</i>   |
| <b>Subtopic ACFTB 6.3 Engine instruments</b>                   |   |   |  |
| ACFTB 6.3.1  | List the vital engine monitoring parameters and their associated instruments.   | 1 | <i>Optional content: Oil pressure and temperature, engine temperature, rpm, fuel state and flow</i>  |
| <b>Subtopic ACFTB 6.4 Aircraft systems</b>                     |   |   |  |
| ACFTB 6.4.1  | Explain the use of the most common aircraft systems.  | 2 | SSR transponder, GPWS, EFIS, Flight director, autopilot, FMS, ice protection systems<br><i>Optional content: SSR transponder, ADS capability, head up display, wind shear indicator, weather radar, GPWS, EFIS, Flight director, autopilot, FMS, hydraulic system, electrical system, environmental system</i> |
| ACFTB 6.4.2  | Explain the impact of degradation/failure of the most common aircraft systems on aircraft operations.                                 | 2 | engine failure<br><i>Optional content: hydraulic failure, electrical failure, environmental system failure, degradation of aircraft position source data</i>   |
| <b>TOPIC ACFTB 7 FACTORS AFFECTING AIRCRAFT PERFORMANCE</b>    |   |   |  |
| <b>Subtopic ACFTB 7.1 Take-off factors</b>                     |   |   |  |
| ACFTB 7.1.1  | Explain the factors affecting aircraft during take-off.   | 2 | Runway conditions, runway slope, wind, temperature, aerodrome elevation, aircraft mass   |
| <b>Subtopic ACFTB 7.2 Climb factors</b>                        |   |   |  |
| ACFTB 7.2.1  | Explain the factors affecting aircraft during climb.  | 2 | Speed, mass, wind, temperature, cabin pressurisation, air density  |
| <b>Subtopic ACFTB 7.3 Cruise factors</b>                       |   |   |  |
| ACFTB 7.3.1  | Explain the factors affecting aircraft during cruise.   | 2 | Level, cruising speed, wind, mass, cabin pressurisation  |
| <b>Subtopic ACFTB 7.4 Descent and initial approach factors</b> |   |   |  |
| ACFTB 7.4.1  | Explain the factors affecting aircraft during descent.  | 2 | Wind, speed, rate of descent, aircraft configuration, cabin pressurisation   |
| ACFTB 7.4.2  | Explain the factors affecting an aircraft in a holding pattern.   | 2 | speed, level, turbulence, icing  |
| <b>Subtopic ACFTB 7.5 Final approach and landing factors</b>   |   |   |  |
| ACFTB 7.5.1  | Explain the factors affecting aircraft during final approach and landing.   | 2 | Aircraft configuration, mass, wind, wind shear, aerodrome elevation, runway conditions, runway slope,  |
| <b>Subtopic ACFTB 7.6 Economic factors</b>                     |   |   |  |

|   |  |   |   |
|---|--|---|---|
| ACFTB 7.6.1                                     | Explain the economic consequences of ATC changes on the flight profile of an aircraft.   | 2 | Routing, flight level, speed, rates of climb or descent   |
| <b>Subtopic ACFTB 7.7 Environmental factors</b> |  |   |   |
| ACFTB 7.7.1                                     | Explain performance restrictions due to <del>ecological</del> environmental constraints. | 2 | Optional content: Continuous descent operation (CDO), fuel dumping, noise abatement procedures, minimum flight levels |
| <b>Subtopic ACFTB 7.8 Miscellaneous factors</b> |  |   |   |
| ACFTB <del>6.8.1</del><br>7.8.1<br>2.1.1 PENB   | <del>Explain special operational requirements which affect aircraft performance.</del>   | 2 | <del>Optional content: Military flying, calibration flights, aerial photography</del>                                 |

## Subject 7 : HUMAN FACTORS

The subject objective is:

Learners shall characterise factors which affect personal and team performance.

### TOPIC HUMB 1 INTRODUCTION TO HUMAN FACTORS

| Subtopic             | HUMB 1.1  | Reference documents and Learning techniques   |
|----------------------|---|---|
| HUMB 1.1.1           | List the topics that will be covered in the course.   | 1 Introduction to human factors, human performance, human error, communication, work environment  |
| HUMB 1.1.1<br>1.1.3  | Appreciate appropriate learning techniques.   | 3 How the influence of interactive techniques can lead to improved learning   |
| HUMB 1.1.2           | List the reference documents used.  | 1 <i>Optional content: ICAO Human Factors Training Manual, EATCHIP/EATMP publications, Air Traffic Control Human Performance Factors, (Anne Isaac 1999), Human Factors in Air Traffic Control, (V. David Hopkin 1995)</i> |
| Subtopic             | HUMB 1.2  | Why Relevance of human factors for ATC  |
| HUMB 1.2.1           | Explain the relevance and importance of why human factors. is a subject in this course.                           | 2 Historical background, safety impact on ATM, licensing requirements, incidents  |
| Subtopic             | HUMB 1.3  | Human factors and ATC   |
| HUMB 1.3.1<br>1.2.2  | Define human factors.   | 1 <i>Optional content: ICAO Human Factors Training Manual</i>   |
| HUMB 1.3.2<br>1.2.7  | Explain the relationship between human factors and the aviation environment. use and benefits of the SHELL model. | 2 <i>Optional content: ICAO Human Factors Training Manual, visits to the simulator and operational room, SHELL model, PEAR model</i>  |
| HUMB 1.3.3<br>1.2.3  | Explain the concept of systems.   | 2 People, procedures, equipment   |
| HUMB 1.3.4<br>1.2.4  | Explain ATM in systems terms.   | 2   |
| HUMB 1.3.5<br>1.2.5  | Explain Recognise the consequences of a systems failure in ATS.   | 2   |
| HUMB 1.3.7<br>1.2.8  | Explain the information requirement of ATC.   | 2 Relevant, timely, accurate  |
| HUMB 1.3.8<br>1.2.9  | Describe the role of the human in the evolution of ATC.   | 2 <i>Optional content: History of ATC, airspace, communications, radar, advanced ATS systems, the future of ATC</i>   |
| HUMB 1.3.9<br>1.2.10 | Explain Recognise the importance of situational awareness for decision making.                                    | 2   |

### TOPIC HUMB 2 HUMAN PERFORMANCE

| Subtopic | HUMB 2.1 | Individual behaviour |
|----------|----------|----------------------|
|----------|----------|----------------------|

|  |   |   |  |
|--|---|---|--|
| HUMB 2.1.1   | Explain the differences and commonalities that exist between people.  | 2 | <i>Optional content: Attitudes, cultural, language</i>   |
| HUMB 2.1.2   | Explain the dangers of boredom.   | 2 |  |
| HUMB 2.1.3   | Explain the dangers of overconfidence and complacency.  | 2 |  |
| HUMB 2.1.4   | Explain the dangers of fatigue.   | 2 | Sleep disturbance, heavy workload  |
| <b>Subtopic HUMB 2.2 Safety culture and professional conduct</b> |   |   |  |
| HUMB 2.2.1   | Characterise the role of air traffic controller for positive safety culture.  | 2 |  |
| HUMB 2.2.2   | Describe the need for professional standards in ATC.  | 2 | <i>Optional content: adherence to rules and regulations etc.</i>   |
| HUMB 2.2.3   | Appreciate <del>Describe</del> the needed basic professional attitudes <b>appropriate to respond</b> to a high level of safety. | 3 | <i>Optional content: punctuality, rigour, adherence to rules, teamwork attitude</i>  |
| HUMB 2.2.4   | <del>Describe</del> <b>Recognise</b> the impact of responsibility on controllers action(s).                                     | 2 | Responsibility as a guidance for appropriate action  |
| HUMB 2.2.5   | Recognise the different responsibilities of a controller.   | 1 | Prospective and retrospective responsibility, guilt and obligation, types of responsibility (moral, welfare, legal, task, role responsibility etc.)                          |
| <b>Subtopic HUMB 2.3 Health and well-being</b>                   |   |   |  |
| HUMB 2.3.1   | Consider the effect of health on performance.   | 2 | <i>Optional content: Fitness, diet, drugs, alcohol</i>   |
| <b>Subtopic HUMB 2.4 Teamwork</b>                                |   |   |  |
| HUMB 2.4.1   | Describe the differences between social human relations and professional interactions.  | 2 |  |
| HUMB 2.4.2   | Describe the different types and characters in a team.  | 2 | <i>Optional content: leader, follower</i>  |
| HUMB 2.4.3   | Appreciate <del>Describe</del> the principles of teamwork.  | 3 | <i>Optional content: team membership, group dynamics, advantages/disadvantages of teamwork, conflicts and their solutions</i>  |
| HUMB 2.4.4   | Describe leader style and group interaction.  | 2 |  |
| <b>Subtopic HUMB 2.5 Basic needs of people at work</b>           |   |   |  |
| HUMB 2.5.1   | List basic needs of people at work.   | 1 | <i>Optional content: Balance between: individual ability and workload, working time and rest periods. Adequate physical working conditions, positive working environment</i> |
| HUMB 2.5.2   | Characterise the factors of work satisfaction.  | 2 | <i>Optional content: money, achievement, recognition, advancement, challenge</i>   |

| <b>Subtopic HUMB 2.6 Stress</b> |   |   |
|---------------------------------|---|---|
| HUMB 2.6.1                      | Define stress.  | 1 Stress definition<br><i>Optional content: EATCHIP Human Factors Module - Stress</i>   |
| HUMB 2.6.2                      | <del>Describe</del> <b>Recognise</b> stress symptoms and sources.       | 2 Behavioural changes, lifestyle changes, physical symptoms, crisis events, main causes of stress<br><i>Optional content: EATCHIP Human Factors Module - Stress</i> |
| HUMB 2.6.3                      | Describe the stages of stress.  | 2 Stress performance curve<br><i>Optional content: EATCHIP Human Factors Module - Stress</i>  |
| HUMB 2.6.4                      | <b>Appreciate</b> <del>Describe</del> techniques for stress management. | 3 <i>Optional content: Relaxation techniques, diet and lifestyle, exercise, EATCHIP Human Factors Module - Stress</i>   |

## TOPIC HUMB 3 HUMAN ERROR

| <b>Subtopic HUMB 3.1 Dangers of error</b>  |  |   |
|--|--|---|
| HUMB 3.1.1   | Recognise the dangers of error in ATC.   | 1 <i>Optional content: Air Traffic Control-Human Performance Factors, (Anne Isaac 1999), Human Factors in Air Traffic Control, (V. David Hopkin 1995)</i>   |
| <b>Subtopic HUMB 3.2 Definition of human error</b>                                     |  |   |
| HUMB 3.2.1   | Define human error.  | 1   |
| HUMB 3.2.2   | Describe the factors which <b>contribute help</b> to cause error.                                  | 2 fatigue, lack of skill, misunderstanding, <b>multitasking</b> , lack of information, distraction, lack of work satisfaction<br><i>Optional content: fatigue, lack of skill, misunderstanding, lack of information, distraction, lack of work satisfaction</i> |
| <b>Subtopic HUMB 3.3 Classification of human error</b>                                 |  |   |
| HUMB 3.3.1   | State the types of errors.   | 1 <i>Optional content: slips, lapses, mistakes</i>  |
| HUMB 3.3.2   | Define violations.   | 1   |
| HUMB 3.3.3   | Differentiate between errors and violations of rules.  | 2   |
| HUMB 3.3.4   | Describe the three levels of performance according to the Rasmussen model.                         | 2 Skill based, knowledge based, rule based  |
| <b>Subtopic HUMB 3.4 <del>The Reason model</del> Risk analysis and risk management</b> |  |   |
| HUMB 3.4.1   | Describe <del>the Reason model</del> risk analysis and risk management of human systems and error. | 2 Active failures and latent conditions<br><i>Optional content: Reason model, HFACS (Human Factors Analysis &amp; Classification System) model, Heinrich Theory</i>   |

|            |   |   |   |
|------------|---|---|---|
| HUMB 3.4.2 | Apply <del>the Reason</del> <del>principles</del> <del>one risk</del> <del>analysis model</del> <del>principles</del> on error during a case study. | 3 | <i>Optional content: Herald of Free Enterprise accident</i> |
|------------|---|---|---|

## TOPIC HUMB 4 COMMUNICATION

### Subtopic HUMB 4.1 Importance of good communications in ATC

|            |   |   |
|------------|---|---|
| HUMB 4.1.1 | Appreciate <del>Demonstrate</del> the importance of good communications in ATC. | 3 |
|------------|---|---|

### Subtopic HUMB 4.2 Communication process

|            |                                   |   |
|------------|-----------------------------------|---|
| HUMB 4.2.1 | Define communication.             | 1 |
| HUMB 4.2.2 | Define the communication process. | 1 |

*Optional content: Sender, encoder, transmitter, signal, interference, reception, decoder, receiver, feedback*

### Subtopic HUMB 4.3 Communication modes

|            |   |   |  |
|------------|---|---|--|
| HUMB 4.3.1 | Describe the factors which affect verbal communication.     | 2 | <i>Optional content: word choice, intonation, speed, tone, distortion, load, expectation, noise, interruption, language knowledge (i.e. accent, dialect, vocabulary)</i> |
| HUMB 4.3.2 | Describe the factors which affect non-verbal communication. | 2 | <i>Optional content: touch, choice, expectation, noise, interruption</i>   |
| HUMB 4.3.3 | Apply good communication practices.                         | 3 | Speaking and listening   |

## TOPIC HUMB 5 THE WORK ENVIRONMENT

### Subtopic HUMB 5.1 Ergonomics and the need for good design

|            |   |   |   |
|------------|---|---|---|
| HUMB 5.1.1 | Define ergonomics.                              | 1 |   |
| HUMB 5.1.2 | Recognise the need for good building design.    | 1 | <i>Optional content: light, insulation, decor, space, facilities</i>                      |
| HUMB 5.1.3 | Explain the need for good work position design. | 2 | <i>Optional content: anthropometry (seating, work station design, input device, etc.)</i> |

### Subtopic HUMB 5.2 Equipment and tools

|            |  |   |  |
|------------|--|---|--|
| HUMB 5.2.1 | Characterise the equipment and tools that will be used in simulation in accordance with the SHELL model. | 2 | The physical environment, visual displays, suites, input devices, communications equipment, console profile and layout |
|------------|--|---|--|

### Subtopic HUMB 5.3 Automation

|            |   |   |
|------------|---|---|
| HUMB 5.3.1 | Explain the reasons for automation.                               | 2 |
| HUMB 5.3.2 | Describe the <del>advantages</del> and constraints of automation. | 2 |



## Subject 8 : EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall explain the basic working principles of equipment that is in general use in ATC and appreciate how this equipment aids the controller in providing safe and efficient ATS.

### TOPIC EQPSB 1 ATC EQUIPMENT

#### Subtopic EQPSB 1.1 Main types of ATC equipment

|             |  |   |   |
|-------------|--|---|---|
| EQPSB 1.1.1 | Explain the relevance of ATC equipment.<br>Characterise the main items of ATC equipment. | 2 | CWP, Communication equipment, ATS surveillance systems<br><i>Optional content: Communication equipment, VDF/UDF, ATS surveillance systems, situation displays</i> |
|-------------|--|---|---|

### TOPIC EQPSB 2 RADIO

#### Subtopic EQPSB 2.1 Radio theory

|             |  |   |   |
|-------------|--|---|---|
| EQPSB 2.1.1 | State principles of radio waves.                                   | 1 |   |
| EQPSB 2.1.2 | Describe Recognise the characteristics of radio waves.             | 2 | Propagation, limitations  |
| EQPSB 2.1.3 | State the use, characteristics and limitations of frequency bands. | 1 | Use in ATC, navigation and communications, use and application in the Aeronautical Mobile Service, HF, VHF, UHF |
| EQPSB 2.1.4 | State the different uses of radio wave spectrum.                   | 1 |   |

#### Subtopic EQPSB 2.2 Direction finding

|                      |  |   |                        |
|----------------------|--|---|------------------------|
| EQPSB 2.2.1<br>2.3.1 | State the principles and use of VDF/UDF.                 | 1 | VDF/UDF, QDM, QDR, QTF |
| EQPSB 2.2.2<br>2.3.2 | State the precision of VDF/UDF used in the State system. | 1 |                        |

### TOPIC EQPSB 3 ~~OTHER SYSTEMS AND~~ COMMUNICATIONS EQUIPMENT

#### Subtopic EQPSB 3.1 Radio communications

|                      |   |   |  |
|----------------------|---|---|--|
| EQPSB 3.1.1<br>2.1.1 | State the use of the radio in ATC.                                      | 1 |  |
| EQPSB 3.1.2<br>2.2.2 | Describe the working principles of a transmitting and receiving system. | 2 |  |
| EQPSB 3.1.3<br>2.2.3 | Explain the effect of antenna shadowing on RTF communications.          | 2 |  |

#### Subtopic EQPSB 3.2 Voice ~~ATC~~ communications between ATS units/positions

|                      |  |   |  |
|----------------------|--|---|--|
| EQPSB 3.2.1<br>3.1.1 | Describe the use of other voice communications in ATC. | 2 | <i>Optional content: telephone, interphone, intercom</i> |
|----------------------|--|---|--|

#### Subtopic EQPSB 3.3 Data link ~~Air-ground~~ communications

EQPSB 3.3.1 Explain **State** the use and benefits of controller pilot datalink communications (CPDLC). 2

#### Subtopic EQPSB 3.4 Airline communications

EQPSB 3.4.1 State the use of SELCAL. 1  
3.2.1

EQPSB 3.4.2 Explain the use and benefits of Aircraft Communications Addressing and Reporting System (ACARS). 2

### TOPIC EQPSB 4 INTRODUCTION TO SURVEILLANCE

#### Subtopic EQPSB 4.1 Surveillance concept in ATS

EQPSB 4.1.1 Describe the concept of surveillance for the provision of ATS. 2

### TOPIC EQPSB 5 RADAR

#### Subtopic EQPSB 5.1 Principles of radar

EQPSB 5.1.1 State the principles of radar. 1

EQPSB 5.1.2 Recognise the characteristics of radar wave lengths. 1

EQPSB 5.1.3 Recognise the use, characteristics and limitations of different radar types. 1 *Optional content: frequency bands, long and short-range radar, weather radar, high-resolution radar*

#### Subtopic EQPSB 5.2 Primary radar

EQPSB 5.2.1 Explain the working principles of PSR. 2

#### Subtopic EQPSB 5.3 Secondary radar

EQPSB 5.3.1 Explain the working principles of SSR. 2 Mode A, Mode C

EQPSB 5.3.2 Explain SSR code management 2 Discrete, non-discrete codes, special codes

EQPSB 5.3.3 Explain the effect of antenna shadowing on SSR operation. 2

#### Subtopic EQPSB 5.4 Use of radars

EQPSB 5.4.1 Explain the use of PSR/SSR in ATC. 2 Area, approach, aerodrome, surface movement radar, DFTI

EQPSB 5.4.2 Explain the advantages and disadvantages of PSR/SSR. 2

#### Subtopic EQPSB 5.5 Mode S

EQPSB 5.5.1 Explain **State** the principles of Mode S. 2

EQPSB 5.5.2 Explain the use of Mode S in ATC systems. 2

### TOPIC EQPSB 6 AUTOMATIC DEPENDENT SURVEILLANCE

|  |   |  |
|--|---|--|
| <b>Subtopic EQPSB 6.1 Principles of automatic dependent surveillance</b>     |   |  |
| EQPSB 6.1.1  | State the different applications of ADS.  | 1 ADS-B, ADS-C   |
| EQPSB 6.1.2  | Explain the working principles of ADS.  | 2  |
| <b>Subtopic EQPSB 6.2 Use of automatic dependent surveillance</b>            |   |  |
| EQPSB 6.2.1  | Describe the use of ADS in ATC.   | 2 Area, approach, aerodrome<br>ICAO Doc 4444   |
| EQPSB 6.2.2  | Explain the limitations of ADS.   | 2 Dependency on GNSS, dependency on airborne equipment                                 |
| <b>TOPIC EQPSB 7 MULTILATERATION</b>   |   |  |
| <b>Subtopic EQPSB 7.1 Principles of multilateration</b>                      |   |  |
| EQPSB 7.1.1  | State the different applications of MLAT.   | 1 <i>Optional content: ATC, Environmental Management, Airport Operations, LAM, WAM</i> |
| EQPSB 7.1.2  | Explain the working principles of MLAT.   | 2 <i>Optional content: Passive and active MLAT</i>                                     |
| <b>Subtopic EQPSB 7.2 Use of multilateration</b>                             |   |  |
| EQPSB 7.2.1  | Describe the use of MLAT in ATC.  | 2 Area, approach, aerodrome  |
| EQPSB 7.2.2  | Explain the limitations of MLAT.  | 2 Dependency on airborne equipment   |
| <b>TOPIC EQPSB 8 SURVEILLANCE DATA PROCESSING</b>                            |   |  |
| <b>Subtopic EQPSB 8.1 Surveillance data networking</b>                       |   |  |
| EQPSB 8.1.1  | Explain the advantages and disadvantages of different surveillance technologies.                  | 2 Data quality, coverage, refresh rate, reliability, redundancy, cost-effectiveness    |
| EQPSB 8.1.2  | Describe the implementation of Surveillance Data Networks.  | 2 <i>Optional content: different technologies/sensors, network</i>                     |
| <b>Subtopic EQPSB 8.2 Working principles of surveillance data networking</b> |   |  |
| EQPSB 8.2.1  | Explain the working principles of surveillance data processing.                                   | 2 Track fusion process, Surveillance information presented on CWP                      |
| EQPSB 8.2.2  | State other use of processed surveillance data.   | 1 <i>Optional content: safety nets, airport operations, environmental management</i>   |
| <b>TOPIC EQPSB 9 FUTURE EQUIPMENT</b>  |   |  |
| <b>Subtopic EQPSB 9.1 New developments</b>                                   |   |  |
| EQPSB 9.1.1  | Name the developments in the equipment field <b>foreseen</b> for introduction in the near future. | 1  |

**TOPIC EQPSB 10 AUTOMATION IN ATS**

| <b>Subtopic EQPSB 10. Principles of automation</b>                                    |   |   |   |
|---|---|---|---|
| EQPSB 10.1.1  | Describe the principles of automation in communication and datalinks in ATS.  | 2 |   |
| <b>Subtopic EQPSB 10. Aeronautical fixed telecommunication network (AFTN)</b>         |   |   |   |
| EQPSB 10.2.1  | Describe the principles of AFTN.  | 2 |   |
| <b>Subtopic EQPSB 10. On-line data interchange</b>                                    |   |   |   |
| EQPSB 10.3.1  | <del>Describe</del> <b>Recognise</b> the benefits of automatic exchange of ATS data in coordination and transfer processes. | 2 | Accuracy, speed and safety, non-verbal communications |
| EQPSB 10.3.2  | <del>Describe</del> <b>Recognise</b> the limitations of automatic exchange of ATS data in coordination.                     | 2 | Non-recognition of a systems failure                  |
| <b>Subtopic EQPSB 10. Closed-circuit information system</b>                           |   |   |   |
| EQPSB <del>10.4.1</del>   | <del>State the principles of CCIS.</del>  | 1 |   |
| EQPSB <del>10.4.2</del>   | <del>Explain the use of CCIS in ATS.</del>  | 2 | <del>Data carried on CCIS</del>                       |
| <b>Subtopic EQPSB 10. Systems used for the automatic dissemination of information</b> |   |   |   |
| EQPSB 10.4.1<br>10.5.1  | State the working principles of broadcasting systems.   | 1 | Optional content: ATIS, VOLMET                        |
| EQPSB 10.4.2<br>10.5.2  | Explain the use of ATIS and VOLMET in ATS.  | 2 |   |

**TOPIC EQPSB 11 WORKING POSITIONS**

| <b>Subtopic EQPSB 11. Working position equipment</b> |   |   |   |
|--|---|---|---|
| EQPSB 11.1.1   | Recognise equipment in a working position.              | 1 | Optional content: FPB, radio, telephone and other communication equipment, relevant maps and charts, strip printer, teleprinter, clock, information monitors, situation displays  |
| <b>Subtopic EQPSB 11. Aerodrome control</b>          |   |   |   |
| EQPSB 11.2.1   | Recognise equipment to be found specifically in a TWR.  | 1 | Optional content: Wind indicator, aerodrome traffic monitor, <del>DFTI</del> , SMR, crash alarm, signalling lamp, lighting control panel, runway-in-use indicator, binoculars, signalling/flare gun, IRVR and altimeter setting indicators, local information systems <b>CCIS</b> |
| <b>Subtopic EQPSB 11. Approach control</b>           |   |   |   |
| EQPSB 11.3.1   | Recognise equipment to be found specifically in an APP. | 1 | Optional content: Sequencing system, PAR, RVR indicators  |
| <b>Subtopic EQPSB 11. Area control</b>               |   |   |   |
| EQPSB 11.4.1   | Recognise equipment to be found specifically in an ACC. | 1 |   |

## Subject 9 : PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall recognise the need for close cooperation with other parties concerning ATM operations and aspects of environmental protection.

### TOPIC PENB 1 FAMILIARISATION

| Subtopic   | PENB 1.1  | ATS and aerodrome facilities |   |
|------------|---|------------------------------|---|
| PENB 1.1.1 | Recognise civil and military ATS facilities.      | 1                            | Optional content: TWR, APP, ACC, AIS, RCC, Air Defence Unit                         |
| PENB 1.1.2 | Recognise airport facilities and local operators. | 1                            | Optional content: fire and emergency services, airline operations <del>office</del> |

### TOPIC PENB 2 AIRSPACE USERS

| Subtopic   | PENB 2.1  | Civil aviation                          |  |
|------------|---|---|--|
| PENB 2.1.1 | Describe <del>Name</del> airspace <del>requirements</del> usage <del>for</del> by civil aircraft          | 2                                       | Optional content: Commercial flying, recreational flying, gliders, balloons, calibration flights, aerial photography, parachute dropping, UASs   |
| Subtopic   | PENB 2.2  | Military <del>aviation</del>            |  |
| PENB 2.2.1 | Describe <del>Name</del> airspace <del>requirements for</del> usage by the military <del>aircraft</del> . | 2                                       | airspace reservations, training, interception, in-flight refuelling, UASs<br>Optional content: Low-level flying, <del>in-flight refuelling</del> , test flights, special military operations |
| Subtopic   | PENB 2.3  | Expectations and requirements of pilots |  |
| PENB 2.3.1 | Recognise the expectations and requirements of pilots.  | 1                                       |  |
| PENB 2.3.2 | State the use of standard operating procedures (SOPs) by aircraft operators.                              | 1                                       |  |

### TOPIC PENB 3 CUSTOMER RELATIONS

| Subtopic   | PENB 3.1                                     | Customer relations |  |
|------------|--|--------------------|--|
| PENB 3.1.1 | State the role of ATC as a service provider. | 1                  |  |
| PENB 3.1.2 | Recognise the means by which ATC is funded.  | 1                  |  |

### TOPIC PENB 4 ENVIRONMENTAL PROTECTION

| Subtopic              | PENB 4.1   | Environmental protection |   |
|-----------------------|--|--------------------------|---|
| PENB <del>4.1.1</del> | <del>Recognise the importance of environmental protection.</del>   | 1                        | <del>Air, water, noise</del>                          |
| PENB 4.1.1            | Describe the impact aviation has on the environment.               | 2                        | Noise, Air Quality, Climate change, Third-party risks |
| PENB 4.1.2            | Explain the role of ATC in the concept of sustainable development. | 2                        | Optional content: ICAO Annex 16                       |

---

PENB 4.1.3 State how to measure, monitor and mitigate the impact aviation has on the environment.

1 *Optional content: EU ETS, SES initiative, EUROCONTROL role, Continuous Descent Operations (CDO), Collaborative Environmental Management (CEM)*

---

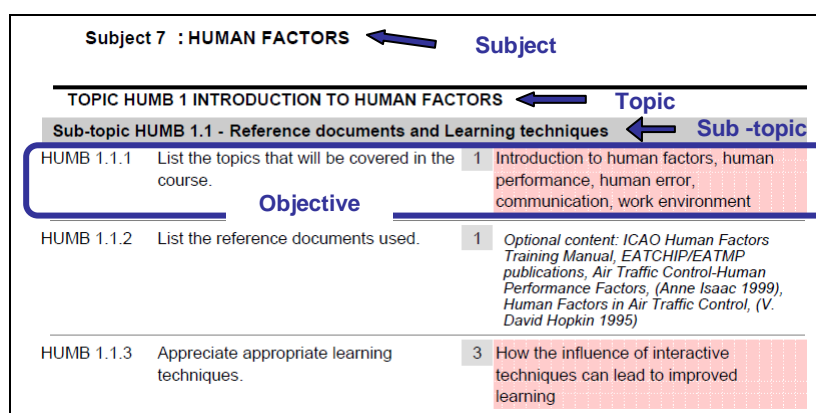
## Supplements

## Supplement 1

### SYLLABI STRUCTURE - HOW TO READ THE TABLES

#### 1. Structure of the Basic training syllabus

- a. The Basic training has been structured as a syllabus, as follows:
  - i. Each syllabus is divided into subjects, which are divided into topics that are in turn divided into sub-topics. This structure is used to create and classify the objectives. There can be one or several objectives linked to each sub-topic.
  - ii. Objectives are assigned to a specific subject which deals with the knowledge and skills needed to accomplish the subject objective contained in Appendix 3 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(1) Basic training)



**Figure 1: Layout of syllabus**

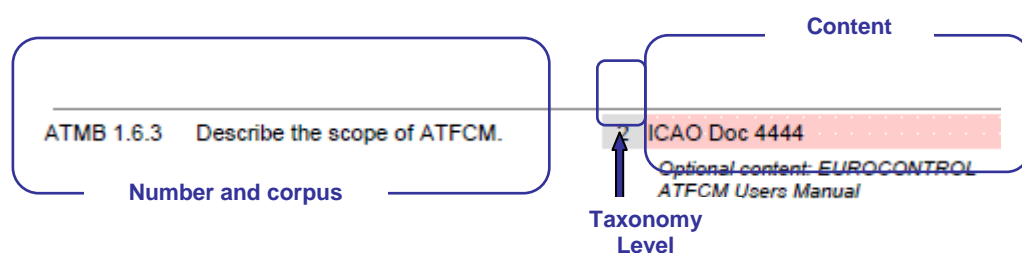
- b. The following principles may be applied to the development of a training course that is based on any of the syllabi:
  - i. The structure of the syllabi and the order of the objectives contained within Appendix 3 to Regulation (EU) No .../... is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.
  - ii. No objective from the Basic syllabus is repeated as 'a refresher' in the Rating syllabi.
  - iii. The number of objectives contained within a sub-topic does not necessarily signify how long it should take to teach that sub-topic. For example, a sub-topic containing five relatively straightforward objectives, may take a shorter period of time to teach, than another sub-topic containing two complex objectives

#### 2. Structure of objectives

- a. An objective consists of three elements:
  - i. The corpus, which is a description of the required performance. It always contains an action verb to ensure that the outcome is observable. The action verb is always associated with a defined taxonomy.



- ii. The level, which indicates numerically the taxonomy of the action verb.
- iii. The content, which may be implicit or explicit. The explicit content is written in the content field, while the implicit content is not but, instead, is implied in the corpus of the objective and other elements (syllabus, subject, etc.). Content that is a required part of the objective is written in the red shaded field. Optional content, written in italics, may be used if considered appropriate.



**Figure 2: Layout of an objective**

3. **Action verbs that support the taxonomy for training objectives:**

The three taxonomy levels represented in the Basic training should be understood to have the following levels of complexity:

a. Action verbs for Level 1

Level 1 - A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

| L1 Verb          | Definition   | Example  |
|------------------|--|--|
| <b>Define</b>    | State what it is and what its limits are; state the definition | Define ATC service   |
| <b>Draw</b>      | Produce a picture, pattern or diagram                          | Draw the block diagram<br>Draw a holding pattern   |
| <b>List</b>      | Say one after the other  | List the main structure components of an aircraft  |
| <b>Name</b>      | Give name of objects or procedures                             | Name the components of an ILS<br>Name the key national and international aviation organisations. |
| <b>Quote</b>     | Repeat of what is written or said to underline                 | Quote ICAO definition of ATC service   |
| <b>Recognise</b> | To know what it is because you've seen it before               | Recognise the information contained in the different parts of the AIP.                           |
| <b>State</b>     | Say or write in a formal or definite way                       | State the meteorological hazards to aviation.  |

## b. Action verbs for Level 2

Level 2 - The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

| L2 Verb                | Definition  | Example  |
|------------------------|---|--|
| <b>Characterise</b>    | To describe the quality of features in something                                  | Characterise the main items of ATC equipment   |
| <b>Consider</b>        | To think carefully about it   | Consider the benefits of Critical Incident Stress Management (CISM).   |
| <b>Demonstrate</b>     | Describe and explain; logically or mathematically proves the truth of a statement | Demonstrate the importance of good communications in ATC.  |
| <b>Describe</b>        | Say what it is like or what happened  | Describe the methods by which ICAO notifies and implements legislation.  |
| <b>Differentiate</b>   | Show the differences between things   | Differentiate between different types of visibility.   |
| <b>Explain</b>         | Give details about something or describe so that it can be understood             | Explain the purpose and function of ICAO   |
| <b>Take account of</b> | Take into consideration before deciding   | Take into account the wind influence when calculating a ground speed.<br>Take account of the limitations of equipment and systems. |

## c. Action verbs for Level 3

Level 3 - A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

| L3 Verb           | Definition  | Example  |
|-------------------|---|--|
| <b>Act</b>        | Carry out, execute  | Act to reduce stress.  |
| <b>Apply</b>      | Use something in a situation or activity  | Apply separation.  |
| <b>Appreciate</b> | To understand a situation and know what is involved in a problem-solving situation, to state a plan without applying it | Appreciate the necessity for coordination. (The learner says that the coordination will be done and with whom, he/she does not perform the actual coordination.) |
| <b>Assist</b>     | Help somebody to do a job by doing part of it   | Assist the pilot   |

| L3 Verb          | Definition  | Example   |
|------------------|---|---|
| <b>Calculate</b> | To discover from information you already have by arithmetic; to think about a possible cause of action in order to form an opinion or decide what to do | Calculate appropriate levels<br>Calculate conversions between the three north designations.                   |
| <b>Check</b>     | Make sure the information is correct (satisfactory)   | Check the accuracy of flight data information<br>Check availability of information material.                  |
| <b>Choose</b>    | Select out of number, decide to do one thing rather than another  | Choose appropriate levels.<br>Choose which aircraft should be vectored  |
| <b>Collect</b>   | Assemble, accumulate, bring or come together  | Collect examples of different types of error, their causes and consequences in ATC.                           |
| <b>Conduct</b>   | Lead, guide   | Conduct coordination  |
| <b>Confirm</b>   | Establish more firmly, corroborate  | Confirm sequence order  |
| <b>Decode</b>    | Turn into ordinary writing, decipher  | Decode the content of weather reports and forecast  |
| <b>Encode</b>    | Put into code or cipher   | Encode and decode flight plans (including supplementary information).   |
| <b>Estimate</b>  | Form an approximate judgement of a number, form an opinion  | Estimate distance and direction between two points  |
| <b>Execute</b>   | Perform action  | Execute corrective actions.   |
| <b>Extract</b>   | Copy out, make extracts from, find, deduce  | Extract pertinent data from relevant sources to produce a flight progress display.                            |
| <b>Identify</b>  | Associate oneself inseparably with, establish the identity  | Identify the role of ATC as a service provider and the requirements of the ATS users.<br>Identify an aircraft |
| <b>Inform</b>    | Inspire, tell   | Inform supervisor of situation.   |
| <b>Initiate</b>  | Begin, set going, originate   | Initiate appropriate coordination   |
| <b>Input</b>     | Enter in the system   | Input data  |
| <b>Issue</b>     | Send forth, publish   | Issue appropriate ATC clearances.<br>Issue appropriate traffic information.                                   |
| <b>Maintain</b>  | Carry on, keep up, refresh  | Maintain flight data display  |
| <b>Measure</b>   | Ascertain extent or quality   | Measure distance on a map   |

| L3 Verb         | Definition   | Example   |
|-----------------|--|---|
|                 | of (thing) by comparison with fixed unit or with object of known size                        |   |
| <b>Monitor</b>  | Keep under observation   | Monitor traffic<br>Monitor the effect of human information processing factors on decision making.         |
| <b>Notify</b>   | Make known, announce, report   | Notify runway in use  |
| <b>Obtain</b>   | Acquire easily, without research   | Obtain meteorological information<br>Obtain information from the relieving controller.                    |
| <b>Operate</b>  | Conduct work on equipment  | Operate the equipment of the controller working position.   |
| <b>Pass</b>     | Move, cause to go, transmit  | Pass essential traffic information without delay  |
| <b>Perform</b>  | Carry into effect, go through, execute   | Perform communication effectively   |
| <b>Process</b>  | To put through the steps of a prescribed procedure   | Process pertinent data on data displays.  |
| <b>Record</b>   | Register, set down for remembrance or reference  | Record information by writing effectively   |
| <b>Relay</b>    | Arrange in, provide with, replace by ...   | Relay meteorological information from pilot reports.  |
| <b>Respond</b>  | Make answer, perform answering or corresponding action                                       | Respond to loss/doubt concerning identification.<br>Respond to distress and urgency messages and signals. |
| <b>Scan</b>     | Continuously observe rapidly, sequentially and selectively in order to extract relevant data | Scan data display   |
| <b>Transfer</b> | Hand over  | Transfer information to the relieving controller  |
| <b>Update</b>   | Refresh, bring up-to-date  | Update the data display to accurately reflect the traffic situation.                                      |
| <b>Use</b>      | Employ for a purpose, handle as instrument, put into operation                               | Use approved phraseology.<br>Use the available means for coordination.                                    |
| <b>Verify</b>   | Establish truth of   | Verify the mode C information   |

- d. Application of taxonomy levels to practically-based objectives
- i. Objectives at taxonomy level 3 or higher, which are of a practical nature, related to all subjects except Air Traffic Management Basic

(ATMB), may be achieved by any suitable type of practical training methods e.g. hands on, plotting on charts, etc.

- ii. Objectives at taxonomy level 3 or higher, for the ATMB subject, are practical by nature and require integration of several knowledge areas and skills at the same time, e.g. vectoring of an aircraft requires knowledge and skills in the areas of radio telephony, aircraft performance, navigation and radar theory. Therefore, ATMB level 3 objectives should be achieved through the use of a part task trainer or a simulator.

## Supplement 2

### Abbreviations

For purposes of AMC1, the following abbreviations and acronyms shall apply:

| Abbreviation | Meaning   |
|--------------|---|
| ABAS         | Aircraft-based Augmentation System (EGNOS)            |
| ACAS         | Airborne Collision Avoidance System                   |
| ACC          | Area Control Centre                                   |
| ACFTB        | Aircraft Basic (subject)                              |
| ADF          | Automatic Direction Finding System                    |
| ADS          | Automatic Dependent Surveillance                      |
| ADVS         | Advisory Service                                      |
| AEA          | Association of European Airlines                      |
| AFTN         | Aeronautical fixed telecommunication network          |
| AIP          | Aeronautical Information Publication                  |
| AIRAC        | Aeronautical Information Regulation and Control       |
| AIRAC SUP    | AIRAC Supplement                                      |
| AIS          | Aeronautical Information Service                      |
| ALRS         | Alerting Service                                      |
| AMC          | Acceptable Means of Compliance                        |
| APM          | Approach Path Monitor                                 |
| APP          | Approach Control / Centre / Procedural Rating         |
| APW          | Area Proximity Warning                                |
| ASM          | Airspace Management                                   |
| ATC          | Air Traffic Control                                   |
| ATCEUC       | Air Traffic Controllers European Unions Co-ordination |
| ATCO         | Air Traffic Controller                                |
| ATCS         | Air Traffic Control Service                           |
| ATFCM        | Air Traffic Flow and Capacity Management              |
| ATFM         | Air Traffic Flow Management                           |
| ATIS         | Automatic Terminal Information Service                |
| ATM          | Air Traffic Management                                |
| ATMB         | Air Traffic Management Basic (subject)                |
| ATS          | Air Traffic Services                                  |
| B-RNAV       | Basic Area Navigation                                 |
| CANSO        | Civil Air Navigation Services Organisation            |
| CBT          | Computer Based Training                               |
| CCIS         | Closed Circuit Information System                     |

|             |   |
|-------------|---|
| CISM        | Critical Incident Stress Management   |
| CPDLC       | Controller Pilot Data Link Communications   |
| DFTI        | Distance from Touchdown Indicator   |
| DME         | Distance Measuring Equipment  |
| Doc         | Document  |
| EASA        | European Aviation Safety Agency   |
| EATCHIP     | European Air Traffic Control Harmonisation and Integration Programme (later 'EATMP' and 'EATM') |
| EATMP       | European Air Traffic Management Programme (later 'EATM')  |
| EC          | European Commission   |
| ECAC        | European Civil Aviation Conference  |
| EFIS        | Electronic Flight Instrument System   |
| EQPSB       | Equipment and Systems Basic (subject)   |
| ESARR       | Eurocontrol Safety Regulatory Requirements  |
| ETF         | European Transport Workers' Federation  |
| EUROCONTROL | European Organisation for the Safety of Air Navigation  |
| FAB         | Functional Airspace Block   |
| FIS         | Flight Information Service  |
| FMS         | Flight Management System  |
| FPB         | Flight Progress Board   |
| FUA         | Flexible Use of Airspace  |
| GBAS        | Ground Based Augmentation System  |
| GLONASS     | Global Orbiting Navigation Satellite System   |
| GNSS        | Global Navigation Satellite System  |
| GPS         | Global Positioning System   |
| HBK         | Handbook  |
| HF          | High Frequency  |
| HUMB        | Human Factors Basic (subject)   |
| IACA        | International Air Carrier Association   |
| IAOPA       | International Council of Aircraft Owner and Pilot Associations                                  |
| IATA        | International Air Transport Association   |
| ICAO        | International Civil Aviation Organisation   |
| IFALPA      | International Federation of Airline Pilots Association  |
| IFATCA      | International Federation of Air Traffic Controllers Associations                                |
| IFPS        | Integrated Initial Flight Plan Processing System  |
| IFR         | Instrument Flight Rules   |
| ILS         | Instrument Landing System   |
| IMC         | Instrument Meteorological Conditions  |
| INS         | Inertial Navigation System  |

|          |   |
|----------|---|
| INTRB    | Introduction to the course Basic (subject)  |
| IRS      | Inertial Reference System   |
| IRVR     | Instrument Runway Visual Range  |
| ISA      | International Standard Atmosphere   |
| ITU      | International Telecommunications Union  |
| LAWB     | Aviation Law Basic (subject)  |
| LNAV     | Lateral Navigation  |
| MET      | Meteorology   |
| METAR    | Meteorological Aviation Routine Weather Report  |
| METB     | Meteorology Basic (subject)   |
| MLS      | Microwave Landing System  |
| Mode A   | SSR identification code   |
| Mode C   | SSR Mode C (Pronounced: Mode Charlie)   |
| Mode S   | Mode Select   |
| MWO      | Meteorological Watch Office   |
| NAVB     | Navigation Basic (subject)  |
| NDB      | Non-Directional Beacon  |
| No       | Number  |
| NOTAM    | Notice to Airmen  |
| OJT      | On the Job Training   |
| P-RNAV   | Precision Area Navigation   |
| PANS     | Procedures for Air Navigation Services  |
| PAR      | Precision Approach Radar  |
| PBN      | Performance Based Navigation  |
| PENB     | Professional Environment Basic (subject)  |
| PSR      | Primary Surveillance Radar  |
| PTP      | Part Time Practice  |
| QDM      | Magnetic Heading  |
| QDR      | Magnetic Bearing  |
| QFE      | Atmospheric pressure at aerodrome elevation   |
| QNH      | Atmospheric pressure at mean sea level  |
| QTF      | The position of the transmitting station according to the bearings taken by the D/F station |
| RAIM     | Receiver Autonomous Integrity Monitoring  |
| RCC      | Rescue Coordination Centre  |
| RNAV     | Area Navigation   |
| RNP      | Required Navigation Performance   |
| RNP-RNAV | Required Navigation Performance-Area Navigation   |
| ROC      | Rate of Climb   |



|               |   |
|---------------|---|
| RTF           | Radio Telephony   |
| RVR           | Runway Visual Range   |
| SADIS         | Satellite Distribution of World Area Forecast System        |
| SAR           | Search and Rescue   |
| SARPs         | Standards and Recommended Practices (ICAO)                  |
| SBAS          | Satellite Based Augmentation System                         |
| SELCAL        | Selective Calling   |
| SERA          | Standardised European Rules of the Air                      |
| SHELL (model) | Software, Hardware, Environment, Live ware, Live ware Model |
| SIGMET        | Significant Meteorological Information                      |
| SMR           | Surface Movement Radar                                      |
| SPECI         | Aviation Selected Special Weather Report                    |
| SRC           | Safety Regulation Commission                                |
| SRU           | Safety Regulation Unit                                      |
| SSR           | Secondary Surveillance Radar                                |
| STCA          | Short Term Conflict Alert                                   |
| TACAN         | UHF Tactical Air Navigation Aid                             |
| TAF           | Terminal Area (Aerodrome) Forecast                          |
| TCAC          | Tropical Cyclone Advisory Centre                            |
| TSA           | Temporary Segregated Area                                   |
| TWR           | Tower Control Unit (Aerodrome Control Tower)                |
| UDF           | Ultra High Frequency Direction Finder                       |
| UHF           | Ultra High Frequency  |
| UTC           | Coordinated Universal Time                                  |
| VAAC          | Volcanic Ash Advisory Centre                                |
| VDF           | Very High Frequency Direction Finder                        |
| VFR           | Visual Flight Rules   |
| VHF           | Very High Frequency   |
| VMC           | Visual Meteorological Conditions                            |
| VNAV          | Vertical Navigation   |
| VOLMET        | Routine Weather Reports Broadcast on VHF                    |
| VOR           | VHF Omni-directional Radio Range                            |
| WAFC          | World Area Forecast Centre                                  |
| WAFS          | World Area Forecast System                                  |
| WGS-84        | World Geodetic System 84                                    |

**ANNEX 1 - PART-ATCO**  
**SUBPART D - ATCO TRAINING**  
**Section 2 - Initial training requirements for Air Traffic Controllers**

**AMC1 to Appendix 4**  
**Aerodrome Control Visual Rating (ADV)**

- A. General principles that apply to this AMC are contained in ~~the~~ ~~its~~ ~~enclosed~~ Supplement 1. ~~to AMC1.~~
- B. ATCO Rating training Aerodrome Control Visual Rating (ADV) should contain the following ~~subject objectives and~~ training objectives that are associated with the subjects, ~~subject objectives,~~ topics and subtopics contained in **Appendix 4 - Aerodrome Control Visual Rating (ADV)**
- C. Subjects, ~~subject objectives,~~ topics and subtopics from ~~the~~ Appendix 4 are repeated in this AMC for the convenience of the reader and do not form a part of it.

## NPA -> CRD TRACK CHANGES FILE

This document has been provided to help reviewers make a comparison between the corresponding AMCs to appendices of the NPA 2012-18 (15 Nov 2012) and the CRD (30 Sep 2013) of Licensing and medical certification of air traffic controllers Implementing Rule - Part (B.V) ATCO Initial training requirements.

To decode the changes the following conventions have been used:

**Deleted** information is shown with the ~~strikethrough-effect~~

**Relocated** information is shown with the ~~strikethrough-effect~~

**New** information is shown in ~~blue text~~.

When an existing objective has been relocated (and consequently renumbered) the new number is shown in black to the left of the objective and the original number in red below the new one.

3.2.1 - current objective number (if not modified it is the same as in NPA 2012-18 (B.V)

3.3.3 - old objective number that may have an additional subject indication if moved from one subject to another or B(asic) and R(ating) if moved from one syllabus to another

1.5.3 - new objective number for relocated objectives at its original location that may have an additional indication of a new subject or B(asic) and R(ating) if moved from one syllabus to another

## TABLE OF CONTENTS

|  |    |
|--|----|
| SUBJECT 1: INTRODUCTION TO THE COURSE-----   | 3  |
| SUBJECT 2: AVIATION LAW-----   | 4  |
| SUBJECT 3: AIR TRAFFIC MANAGEMENT-----   | 6  |
| SUBJECT 4: METEOROLOGY-----  | 14 |
| SUBJECT 5: NAVIGATION-----   | 15 |
| SUBJECT 6: AIRCRAFT-----   | 16 |
| SUBJECT 7: HUMAN FACTORS-----  | 18 |
| SUBJECT 8: EQUIPMENT AND SYSTEMS-----  | 23 |
| SUBJECT 9: PROFESSIONAL ENVIRONMENT-----   | 25 |
| SUBJECT 10: <del>UNUSUAL/DEGRADED</del> ABNORMAL AND EMERGENCY<br>SITUATIONS ----- | 27 |
| SUBJECT 11: AERODROMES -----   | 30 |
| Supplements -----  | 33 |

## Subject 1 : INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

### TOPIC INTR 1 COURSE MANAGEMENT

| Subtopic          | INTR 1.1 Course introduction  |   |  |     |
|-------------------|---|---|--|-----|
| ADV<br>INTR 1.1.1 | Explain the aims and main objectives of the course.                 | 2 |  | ALL |
| Subtopic          | INTR 1.2 Course administration                                      |   |  |     |
| ADV<br>INTR 1.2.1 | State course administration.  | 1 |  | ALL |
| Subtopic          | INTR 1.3 Study material and training documentation                  |   |  |     |
| ADV<br>INTR 1.3.1 | Use appropriate documentation and their sources for course studies. | 3 | Optional content: Training documentation, library, CBT library, Web, Learning Management Server        | ALL |
| ADV<br>INTR 1.3.2 | Integrate appropriate information into course studies.              | 4 | Training documentation<br>Optional content: Training documentation, supplementary information, library | ALL |

### TOPIC INTR 2 INTRODUCTION TO THE ATC TRAINING COURSE

| Subtopic          | INTR 2.1 Course content and organisation                    |   |  |     |
|-------------------|---|---|--|-----|
| ADV<br>INTR 2.1.1 | State the different training methods applied in the course. | 1 | Theoretical training, practical training, self-study, types of training events                                   | ALL |
| ADV<br>INTR 2.1.2 | State the subjects of the course and their purpose.         | 1 |  | ALL |
| ADV<br>INTR 2.1.3 | Describe the organisation of theoretical training.          | 2 | Optional content: course programme   | ALL |
| ADV<br>INTR 2.1.4 | Describe the organisation of practical training.            | 2 | Optional content: PTP, Simulation, Briefing, Debriefing, course programme  | ALL |
| Subtopic          | INTR 2.2 Training ethos                                     |   |  |     |
| ADV<br>INTR 2.2.1 | Recognise the feedback mechanisms available.                | 1 | Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback | ALL |
| Subtopic          | INTR 2.3 Assessment process                                 |   |  |     |
| ADV<br>INTR 2.3.1 | Describe the assessment process.                            | 2 |  | ALL |

## Subject 2 : AVIATION LAW

The subject objective is:

Learners shall ~~+~~ know, understand and apply the Rules of the Air and the Regulations regarding reporting, airspace and ~~+~~ appreciate the Licensing and Competence principles.

### TOPIC LAW 1 ATCO LICENSING / CERTIFICATE OF COMPETENCE

| Subtopic                      | LAW 1.1 Privileges and conditions   |   |  |     |
|-------------------------------|---|---|--|-----|
| ADV<br>LAW 1.1.1              | Appreciate the conditions which <del>must</del> <b>shall</b> be met <del>to for the</del> issue <del>an of</del> Aerodrome Control Visual rating. | 3 | Commission Regulation (EU) <b>on ATCO Licensing No xxx/yyyy 805/2011</b> | ADV |
|                               |   |   | <i>Optional content: National documents</i>                              |     |
| ADV<br>LAW 1.1.2<br>6.1.1 HUM | Explain how to maintain and update professional knowledge <b>and skills</b> to retain competence in the operational environment.                  | 2 |  | ALL |
| ADV<br>LAW 1.1.3<br>1.1.2     | Explain the conditions for suspension/revocation of ATCO licence.   | 2 | Commission Regulation (EU) <b>on ATCO Licensing No xxx/yyyy 805/2011</b> | ALL |

### TOPIC LAW 2 RULES AND REGULATIONS

| Subtopic         | LAW 2.1 Reports   |   |   |     |
|------------------|---|---|---|-----|
| ADV<br>LAW 2.1.1 | List the standard forms for reports.  | 1 | Air traffic incident report   | ALL |
|                  |   |   | <i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>  |     |
| ADV<br>LAW 2.1.2 | Describe the functions of, and processes for, reporting.  | 2 | Reporting culture, Air traffic incident report  | ALL |
|                  |   |   | <i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>   |     |
| ADV<br>LAW 2.1.3 | Use forms for reporting.  | 3 | Air traffic incident reporting form(s)  | ALL |
|                  |   |   | <i>Optional content: ICAO Doc 4444 Appendix 4, routine air reports, breach of regulations, watch/log book, records</i>  |     |
| Subtopic         | LAW 2.2 Airspace  |   |   |     |
| ADV<br>LAW 2.2.1 | Appreciate classes and structure of airspace and their relevance to Aerodrome Control Visual rating operations. | 3 |   | ADV |
| ADV<br>LAW 2.2.2 | Provide planning, coordination and control actions appropriate to the airspace classification and structure.    | 4 | <i>Optional content: ICAO Annex 2, ICAO Annex 11, International requirements, Civil requirements, Military requirements, Areas of responsibility, Sectorisation, <b>National requirements</b></i> | ALL |
| ADV<br>LAW 2.2.3 | Appreciate responsibility for terrain clearance.  | 3 |   | ALL |

### TOPIC LAW 3 ATC SAFETY MANAGEMENT

| Subtopic                       | LAW 3.1 <del>Experience</del> Feedback process   |   |  |     |
|--------------------------------|--|---|--|-----|
| ADV<br>LAW 3.1.1<br>10.1.1 HUM | State the importance of <del>the</del> controllers contribution to the <del>experience</del> feedback process. | 1 | Optional content: voluntary reporting  | ALL |
| ADV<br>LAW 3.1.2<br>10.1.2 HUM | Describe how reported occurrences are analysed.  | 2 | Optional content: ESARR 2, local procedures  | ALL |
| ADV<br>LAW 3.1.3<br>10.1.3 HUM | Name the means used to disseminate recommendations.  | 1 | Optional content: Safety letters, safety boards web pages                              | ALL |
| ADV<br>LAW 3.1.4<br>10.1.4 HUM | <del>Appreciate</del> <del>Explain</del> the 'Just Culture' concept.   | 3 | Benefits, prerequisites, constraints<br><br>Optional content: EAM 2 GUI 6, GAIN Report | ALL |
| Subtopic                       | LAW 3.2 <del>Safety Investigation</del> Branch   |   |  |     |
| ADV<br>LAW 3.2.1<br>10.2.1 HUM | Describe role and mission of Safety Investigation <del>Branch</del> in the improvement of safety.              | 2 |  | ALL |
| ADV<br>LAW 3.2.2<br>10.2.2 HUM | Define working methods of Safety Investigation <del>Branch</del> .   | 1 |  | ALL |

### Subject 3 : AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

| TOPIC                     | ATM 1   | PROVISION OF SERVICES AIR TRAFFIC SERVICES AND AIRSPACE MANAGEMENT |   |            |  |
|---------------------------|---|--|---|------------|--|
| Subtopic                  | ATM 1.1 Aerodrome control service   |  |   |            |  |
| ADV<br>ATM 1.1.1<br>1.1.2 | Appreciate areas of responsibility.   | 3  | Control Zone, Traffic Circuit, Manoeuvring Area, Movement Area, Vicinity<br><br>Optional content: ATZ   | ADV<br>ADI |  |
| ADV<br>ATM 1.1.1          | <del>Describe specific areas of responsibility of aerodrome control.</del>                          | 2  | <del>ICAO Annex 11</del>  | ADV<br>ADI |  |
| ADV<br>ATM 1.1.2<br>1.1.3 | Provide <del>the appropriate</del> aerodrome control service.                                       | 4  | ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals  | ADV<br>ADI |  |
| Subtopic                  | ATM 1.2 Flight information service (FIS)  |  |   |            |  |
| ADV<br>ATM 1.2.1          | Describe the information that shall be passed to aircraft by an aerodrome controller.               | 2  | ICAO Annex 11   | ADV<br>ADI |  |
| ADV<br>ATM 1.2.2          | Provide FIS.  | 4  | ICAO Doc 4444<br><br>Optional content: national documents   | ALL        |  |
| ADV<br>ATM 1.2.3          | Issue appropriate <del>traffic</del> information.   | 3  | ICAO Doc 4444, <del>essential local traffic, traffic information</del>  | ADV<br>ADI |  |
| ADV<br>ATM 1.2.4          | Appreciate the use of ATIS for the provision of flight information service by aerodrome controller. | 3  |   | ADV<br>ADI |  |
| Subtopic                  | ATM 1.3 Alerting service (ALRS)   |  |   |            |  |
| ADV<br>ATM 1.3.1          | Provide ALRS.   | 4  | ICAO Doc 4444<br><br>Optional content: national documents   | ALL        |  |
| ADV<br>ATM 1.3.2          | Respond to distress and urgency messages and signals.   | 3  | ICAO Annex 10, ICAO Doc 4444,<br><br>Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations | ALL        |  |
| Subtopic                  | ATM 1.4 ATS System capacity and air traffic flow management   |  |   |            |  |
| ADV<br>ATM 1.4.1          | Appreciate principles of <del>ATFCM</del> ATS system capacity and air traffic flow management.      | 3  | Optional content: EUROCONTROL ATFCM Users Manual <del>Working principles of ATFCM, CFMU, Slot management, Slot allocation procedures</del>            | ADV<br>ADI |  |

|                  |  |   |  |            |
|------------------|--|---|--|------------|
| ADV<br>ATM 1.4.2 | Organise traffic to take account of flow management. | 4 | <i>Optional content: departure sequence</i>  | ADV<br>ADI |
| ADV<br>ATM 1.4.3 | Inform appropriate authority.                        | 3 | <i>Optional content: abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, unusual meteorological conditions, relevant information: reported ground-based incidents, forest fire, smoke, oil pollution</i> | ADV<br>ADI |

## TOPIC ATM 2 COMMUNICATION

| Subtopic                                 | ATM 2.1 Effective communication  |   |   |     |
|--|--|---|---|-----|
| ADV<br>ATM 2.1.1                         | Use approved phraseology.  | 3 | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2</i> | ALL |
| ADV<br>ATM 2.1.2                         | Ensure effective <del>Perform</del> communication.<br><del>effectively.</del>        | 4 | Communication techniques,<br>Readback/verification of readback  | ALL |
| ADV<br>ATM <del>2.1.3</del><br>6.1.2 HUM | <del>Analyse examples of pilot and controller communication for effectiveness.</del> | 4 |   | ALL |

## TOPIC ATM 3 ATC CLEARANCES AND ATC INSTRUCTIONS

| Subtopic         | ATM 3.1 ATC clearances                                     |   |  |     |
|------------------|--|---|--|-----|
| ADV<br>ATM 3.1.1 | Issue appropriate ATC clearances.                          | 3 | ICAO Doc 4444<br><i>Optional content: national documents</i> | ALL |
| ADV<br>ATM 3.1.2 | Integrate appropriate ATC clearances in control service.   | 4 |  | ALL |
| ADV<br>ATM 3.1.3 | Ensure the agreed course of action is carried out.         | 4 |  | ALL |
| Subtopic         | ATM 3.2 ATC instructions                                   |   |  |     |
| ADV<br>ATM 3.2.1 | Issue appropriate ATC instructions.                        | 3 | ICAO Doc 4444<br><i>Optional content: national documents</i> | ALL |
| ADV<br>ATM 3.2.2 | Integrate appropriate ATC instructions in control service. | 4 |  | ALL |
| ADV<br>ATM 3.2.3 | Ensure the agreed course of action is carried out.         | 4 |  | ALL |

## TOPIC ATM 4 COORDINATION

| Subtopic | ATM 4.1 Necessity for coordination |  |  |  |
|----------|------------------------------------|--|--|--|
|----------|------------------------------------|--|--|--|



|   |  |   |  |            |
|---|--|---|--|------------|
| ADV<br>ATM 4.1.1  | Identify the need for coordination.  | 3 |  | ALL        |
| <b>Subtopic ATM 4.2 Tools and methods for coordination</b>                                |  |   |  |            |
| ADV<br>ATM 4.2.1  | Use the available tools for coordination.  | 3 | <i>Optional content: Electronic transfer of flight data, Telephone, Interphone, Intercom, Direct speech, Radiotelephone (RTF), Local agreements, automated system coordination</i> | ALL        |
| <b>Subtopic ATM 4.3 Coordination procedures</b>   |  |   |  |            |
| ADV<br>ATM 4.3.1  | Initiate appropriate coordination.   | 3 | Delegation/transfer of responsibility for air-ground communications and separation, transfer of control, etc. ICAO Doc 4444<br><i>Optional content: release point</i>              | ALL        |
| ADV<br>ATM 4.3.2  | Analyse effect of coordination requested by an adjacent position/unit.                   | 4 | <i>Optional content: Delegation/transfer of responsibility for air-ground communications and separation, release point, transfer of control, etc.</i>                              | ALL        |
| ADV<br>ATM 4.3.3  | Select, after negotiation, an appropriate course of action.                              | 5 | <del>When additional traffic cannot be accepted by adjacent position/unit ;<br/>When additional traffic cannot be accepted by own position/unit, etc.</del>                        | ALL        |
| ADV<br>ATM 4.3.4  | Ensure the agreed course of action is carried out.                                       | 4 |  | ALL        |
| ADV<br>ATM 4.3.5  | Coordinate in the provision of FIS.  | 4 | ICAO Doc 4444  | ALL        |
| ADV<br>ATM 4.3.6  | Coordinate in the provision of ALRS.   | 4 | ICAO Doc 4444  | ALL        |
| <b>TOPIC ATM 5 ALTIMETRY AND LEVEL ALLOCATION</b>   |  |   |  |            |
| <b>Subtopic ATM 5.1 Altimetry</b>   |  |   |  |            |
| ADV<br>ATM 5.1.1  | Allocate levels <del>(height, altitude, flight level)</del> according to altimetry data. | 4 | ICAO Doc 8168, ICAO Doc 4444   | ALL        |
| ADV<br>ATM 5.1.2  | Ensure separation according to altimetry data.   | 4 | <i>Optional content: Transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries</i>                         | ALL        |
| <b>TOPIC ATM 6 SEPARATIONS</b>  |  |   |  |            |
| <b>Subtopic ATM 6.1 Separation between departing aircraft</b>                             |  |   |  |            |
| ADV<br>ATM 6.1.1  | Provide separation between departing aircraft.   | 4 | ICAO Doc 4444  | ADV<br>ADI |
| <b>Subtopic ATM 6.2 Separation of landing aircraft and preceding landing or departing</b> |  |   |  |            |

|  |   |   |   |            |
|--|---|---|---|------------|
| ADV<br>ATM 6.2.1   | Provide separation of landing aircraft and preceding landing or departing aircraft.               | 4 | ICAO Doc 4444   | ADV<br>ADI |
| <b>Subtopic ATM 6.3 Time based wake turbulence longitudinal separation</b>           |   |   |   |            |
| ADV<br>ATM 6.3.1   | Provide time-based wake turbulence longitudinal separation.                                       | 4 | ICAO Doc 4444   | ADV        |
| <b>Subtopic ATM 6.4 Reduced separation minima</b>                                    |   |   |   |            |
| ADV<br>ATM 6.4.1   | Provide reduced separation minima.  | 4 | ICAO Doc 4444   | ADV        |
| <b>TOPIC ATM 7 AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS</b> |   |   |   |            |
| <b>Subtopic ATM 7.1 Airborne collision avoidance systems</b>                         |   |   |   |            |
| ADV<br>ATM 7.1.1<br>7.1.6 B  | Differentiate between ACAS advisory thresholds and <del>ATC</del> aerodrome separation standards. | 2 | ICAO Doc 9863   | ADV<br>ADI |
| ADV<br>ATM 7.1.2<br>7.1.4 B  | Describe the controller responsibility during and following an ACAS RA reported by pilot.         | 2 | ICAO Doc 4444   | ALL        |
| ADV<br>ATM 7.1.3<br>7.1.1  | Respond to pilot notification of actions based on airborne systems warnings.                      | 3 | ACAS, <del>GPWS</del> TAWS<br><i>Optional content: EUROCONTROL ACAS Web page</i>  | ADV<br>ADI |
| <b>Subtopic ATM 7.2 Ground-based safety nets</b>                                     |   |   |   |            |
| ADV<br>ATM 7.2.1   | Respond to available ground-based safety nets warnings.   | 3 | <i>Optional content: Anti-incursion</i>   | ADV<br>ADI |
| <b>TOPIC ATM 8 DATA DISPLAY</b>  |   |   |   |            |
| <b>Subtopic ATM 8.1 Data management</b>  |   |   |   |            |
| ADV<br>ATM 8.1.1   | Update the data display to accurately reflect the traffic situation.                              | 3 | <i>Optional content: Information displayed, strip marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs</i> | ALL        |
| ADV<br>ATM 8.1.2   | Analyse pertinent data on data displays.  | 4 |   | ALL        |
| ADV<br>ATM 8.1.3   | Organise pertinent data on data displays.   | 4 |   | ALL        |
| ADV<br>ATM <del>8.1.4</del>  | <del>Process pertinent data on data displays.</del>   | 3 |   | ALL        |

|                           |                                 |   |   |     |
|---------------------------|---------------------------------|---|---|-----|
| ADV<br>ATM 8.1.4<br>8.1.5 | Obtain flight plan information. | 3 | CPL, FPL, Supplementary information<br><i>Optional content: RPL, AFIL, etc.</i> | ALL |
| ADV<br>ATM 8.1.5<br>8.1.6 | Use flight plan information.    | 3 |   | ALL |

## TOPIC ATM 9 OPERATIONAL ENVIRONMENT (SIMULATED)

| Subtopic ATM 9.1 Integrity of the operational environment               |  |   |   |            |
|---|--|---|---|------------|
| ADV<br>ATM 9.1.1  | Obtain information concerning the operational environment. | 3 | <i>Optional content: Briefing, notices, local orders, verification of information</i>           | ALL        |
| ADV<br>ATM 9.1.2  | Ensure the integrity of the operational environment.       | 4 | <i>Optional content: Frequency, VOLMET, ATIS, SIGMET, Systems set-up, Integrity of displays</i> | ADV<br>ADI |
| Subtopic ATM 9.2 Verification of the currency of operational procedures |  |   |   |            |
| ADV<br>ATM 9.2.1  | Check all relevant documentation before managing traffic.  | 3 | <i>Optional content: Briefing, LOAs, NOTAM, AICs</i>  | ALL        |
| Subtopic ATM 9.3 Handover-takeover                                      |  |   |   |            |
| ADV<br>ATM 9.3.1  | Transfer information to the relieving controller.          | 3 |   | ALL        |
| ADV<br>ATM 9.3.2  | Obtain information from the controller handing over.       | 3 |   | ALL        |

## TOPIC ATM 10 PROVISION OF AN AERODROME CONTROL SERVICE

| Subtopic ATM 10. Responsibility for the provision     |   |   |   |            |
|---|---|---|---|------------|
| ADV<br>ATM 10.1.1                                     | Explain the responsibility for the provision of an aerodrome control service. | 2 | ICAO Doc 4444, ICAO Annex 11  | ADV<br>ADI |
| ADV<br>ATM 10.1.2                                     | Describe the division of responsibility between air traffic control units.    | 2 | ICAO Doc 4444   | ALL        |
| ADV<br>ATM 10.1.3                                     | Describe the responsibility in regard to military traffic.                    | 2 | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9554</i>                           | ALL        |
| ADV<br>ATM 10.1.4                                     | Describe the responsibility in regard to unmanned free balloons.              | 2 | ICAO Doc 4444   | ADV<br>ADI |
| ADV<br>ATM 10.1.5<br>3.5.1 ACFT                       | Appreciate the influence of operational requirements.                         | 3 | <i>Optional content: Military flying, Calibration flights, Aerial photography</i> | ALL        |
| Subtopic ATM 10. Functions of aerodrome control tower |   |   |   |            |

|  |   |   |  |            |
|--|---|---|--|------------|
| ADV<br>ATM 10.2.1  | Manage the general functions of aerodrome control.  | 4 | ICAO Doc 4444  | ADV<br>ADI |
| ADV<br>ATM 10.2.2  | Manage the suspension of VFR operations.  | 4 | ICAO Doc 4444  | ADV<br>ADI |
| <b>Subtopic ATM 10. Traffic management process</b>                         |   |   |  |            |
| ADV<br>ATM 10.3.1  | Ensure that situational awareness is maintained.  | 4 | Information gathering, observation, traffic projection | ADV<br>ADI |
| ADV<br>ATM 10.3.2  | Detect conflicts in time for appropriate resolution.  | 4 |  | ALL        |
| ADV<br>ATM 10.3.3  | Identify potential solutions to achieve a safe and effective flow of aerodrome traffic.     | 3 |  | ADV<br>ADI |
| ADV<br>ATM 10.3.4  | Evaluate possible outcomes of different control actions.                                    | 5 |  | ADV<br>ADI |
| ADV<br>ATM 10.3.5  | Select an appropriate plan in time to achieve safe and effective flow of aerodrome traffic. | 5 |  | ADV<br>ADI |
| ADV<br>ATM 10.3.6<br>10.5.4  | Ensure an adequate priority of actions.   | 4 | Formal and situational requirements, Workload          | ALL        |
| ADV<br>ATM 10.3.7  | Execute plan in a timely manner.  | 3 |  | ADV<br>ADI |
| ADV<br>ATM 10.3.8  | Ensure a safe and efficient outcome is achieved.  | 4 | Traffic monitoring, adaptability and follow up         | ALL        |
| <b>Subtopic ATM 10. Aeronautical ground lights</b>                         |   |   |  |            |
| ADV<br>ATM 10.4.1<br>10.3.1  | Select appropriate aeronautical ground lights.  | 5 | ICAO Doc 4444  | ADV<br>ADI |
| <b>Subtopic ATM 10. Information to aircraft by aerodrome control tower</b> |   |   |  |            |
| ADV<br>ATM 10.5.1<br>10.4.1  | Provide information related to the operation of aircraft.                                   | 4 | ICAO Doc 4444  | ADV<br>ADI |
| ADV<br>ATM 10.5.2<br>10.4.2  | Provide information on aerodrome conditions.  | 4 | ICAO Doc 4444  | ADV<br>ADI |
| <b>Subtopic ATM 10. Control of aerodrome traffic</b>                       |   |   |  |            |

|   |   |   |  |            |
|---|---|---|--|------------|
| ADV<br>ATM 10.6.1<br>10.5.1                                       | Predict positions of aircraft in the aerodrome traffic and taxi circuits.                   | 4 | ICAO Doc 4444  | ADV<br>ADI |
| ADV<br>ATM 10.6.2<br>10.5.2                                       | Manage traffic on the manoeuvring area.   | 4 | ICAO Doc 4444<br>Aircraft, vehicles<br><i>Optional content: runway inspection</i>                                    | ADV<br>ADI |
| ADV<br>ATM 10.6.3<br>10.5.3                                       | Manage traffic in accordance with procedural changes.                                       | 4 | <i>Optional content: Taxiway closure</i>   | ADV<br>ADI |
| ADV<br>ATM 10.6.4   | Balance the workload against personal capacity.   | 5 | <i>Optional content: re-planning, prioritising solutions, denying requests, delaying traffic</i>                     | ADV<br>ADI |
| ADV<br>ATM 10.5.4<br>10.3.6                                       | Ensure an adequate priority of actions.   | 4 | <del>Formal and situational requirements, Workload</del>   | ADV<br>ADI |
| <b>Subtopic ATM 10. Control of traffic in the traffic circuit</b> |   |   |  |            |
| ADV<br>ATM 10.7.1<br>10.6.1                                       | Manage traffic in the traffic circuit.  | 4 | ICAO Doc 4444<br>Meteorological phenomena,<br>Geographical knowledge,<br>Environmental factors                       | ADV<br>ADI |
| ADV<br>ATM 10.7.2<br>10.6.2                                       | Manage arriving and departing traffic.  | 4 | ICAO Doc 4444, Allocation of the order of priority, Meteorological phenomena, Wake turbulence, Environmental factors | ADV<br>ADI |
| ADV<br>ATM 10.7.3<br>10.6.3                                       | Integrate the serviceability of radio aids in the management of aerodrome traffic.          | 4 | <i>Optional content: UDF, VDF, MLS, ILS, NDB, VOR, DME</i>   | ADV<br>ADI |
| ADV<br>ATM 10.7.4<br>10.6.4                                       | Integrate surface conditions into the control of aerodrome traffic.                         | 4 | <i>Optional content: Damp, Wet, Water patches, Flooding, Snow, Slush, Ice, Braking action</i>                        | ADV<br>ADI |
| ADV<br>ATM 10.7.5<br>10.6.5                                       | Integrate information about meteorological phenomena into the control of aerodrome traffic. | 4 | <i>Optional content: Clouds, Precipitation, Visibility, Wind, Meteorological hazards</i>                             | ADV<br>ADI |
| ADV<br>ATM 10.7.6<br>10.6.6                                       | Integrate the information provided by situation displays.                                   | 4 | Use, Advantages, Disadvantages   | ADV<br>ADI |
| ADV<br>ATM 10.7.7   | Initiate missed approach.   | 3 | <i>Optional content: obstructed runway</i>   | ADV<br>ADI |
| <b>Subtopic ATM 10. Runway in use</b>                             |   |   |  |            |

|                             |  |   |   |            |
|-----------------------------|--|---|---|------------|
| ADV<br>ATM 10.8.1<br>10.7.1 | Select the runway in use.                            | 5 | ICAO Doc 4444   | ADV<br>ADI |
| ADV<br>ATM 10.8.2<br>10.7.2 | Coordinate runway in use.                            | 4 | <i>Optional content: Approach control, Area control, runway selection, change of runway</i> | ADV<br>ADI |
| ADV<br>ATM 10.8.3<br>10.7.3 | Manage traffic in the event of runway-in-use change. | 4 |   | ADV<br>ADI |

## Subject 4 : METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

### TOPIC MET 1 METEOROLOGICAL PHENOMENA

| Subtopic         | MET 1.1 Meteorological phenomena  |   |  |            |
|------------------|---|---|--|------------|
| ADV<br>MET 1.1.1 | Appreciate the impact of different cloud types.                         | 3 | Cumulus, Cumulonimbus<br><i>Optional content: Stratus, Nimbostratus, etc.</i>                                      | ADV<br>ADI |
| ADV<br>MET 1.1.2 | Appreciate the impact of precipitation.                                 | 3 | Precipitation and Microphysics<br><i>Optional content: Rain, Snow, Sleet, Hail</i>                                 | ADV<br>ADI |
| ADV<br>MET 1.1.3 | Appreciate the impact of atmospheric obscurity.                         | 3 | <i>Optional content: Advection fog, Radiation fog, Mixing, Evaporation, Mist, Drizzle</i>                          | ADV<br>ADI |
| ADV<br>MET 1.1.4 | Appreciate the effect and impact of wind.                               | 3 | Gusting, Veering, Backing<br><i>Optional content: Land breezes, Sea breezes, Föhn</i>                              | ADV<br>ADI |
| ADV<br>MET 1.1.5 | Appreciate the effect and danger of hazardous meteorological phenomena. | 3 | Wind shear, Turbulence, Thunderstorms, Icing, Microbursts  | ADV<br>ADI |
| ADV<br>MET 1.1.6 | Appreciate the effect of a frontal system on aerodrome operations.      | 3 |  | ADV<br>ADI |
| ADV<br>MET 1.1.7 | Integrate data about meteorological phenomena into provision of ATS.    | 4 | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena</i> | ALL        |

### TOPIC MET 2 SOURCES OF METEOROLOGICAL DATA

| Subtopic         | MET 2.1 Meteorological instruments  |   |   |            |
|------------------|---|---|---|------------|
| ADV<br>MET 2.1.1 | Extract information from meteorological instruments.                            | 3 | <i>Optional content: Anemometer, RVR indicator, Cloud base indicator, Ceilometer, Barometer</i> | ADV<br>ADI |
| Subtopic         | MET 2.2 Other sources of meteorological data                                    |   |   |            |
| ADV<br>MET 2.2.1 | Decode information from-meteorological data displays.                           | 3 |   | ADV<br>ADI |
| ADV<br>MET 2.2.2 | Use appropriate communication tools and networks to obtain meteorological data. | 3 |   | ADV<br>ADI |
| ADV<br>MET 2.2.3 | Relay meteorological information. <del>from pilot reports:</del>                | 3 | ICAO Doc 4444<br><i>Optional content: flight information centre, adjacent ATS unit</i>          | ADV<br>ADI |

## Subject 5 : NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

| TOPIC NAV 1 MAPS AND AERONAUTICAL CHARTS |   |   |   |                          |  |
|--|---|---|---|--------------------------|--|
| Subtopic                                 | NAV 1.1 Maps and charts   |   |   |                          |  |
| ADV<br>NAV 1.1.1                         | Decode symbols and information displayed on aeronautical maps and charts.                                     | 3 | Visual approach/ <del>departure</del> charts, <del>instrument approach charts</del> , aerodrome charts<br><br><i>Optional content: Military maps and charts</i> | ADV                      |  |
| ADV<br>NAV 1.1.2                         | Use relevant maps and charts.   | 3 | Visual approach/departure charts, aerodrome charts<br><br><i>Optional content: Military maps and charts</i>   | ADV                      |  |
| TOPIC NAV 2 INSTRUMENTAL NAVIGATION      |   |   |   |                          |  |
| Subtopic                                 | NAV 2.1 Navigational systems  |   |   |                          |  |
| ADV<br>NAV 2.1.1                         | Describe the possible operational status of navigational systems.   | 2 | <i>Optional content: NDB, VOR, DME</i>  | ADV                      |  |
| ADV<br>NAV 2.1.2                         | Decode operational status displays of navigational systems.   | 3 | <i>Optional content: NDB, VOR, DME</i>  | ADV                      |  |
| ADV<br>NAV 2.1.3                         | Appreciate the effect of precision, limitations and change of the operational status of navigational systems. | 3 | <i>Optional content: limitations, status, degraded procedures</i>   | ALL                      |  |
| ADV<br>NAV <del>2.1.4</del>              | <del>Manage traffic in case of change in the operational status of navigational systems.</del>                | 4 | <del><i>Optional content: limitations, status of ground-based systems</i></del>   | ADV                      |  |
| Subtopic                                 | NAV 2.2 Stabilised approach   |   |   |                          |  |
| ADV<br>NAV 2.2.1                         | Describe the concept of stabilised approach.  | 2 | ICAO Doc 8168, Regulation (EC) No 1899/2006<br><br><i>Optional content: SKYbrary</i>  | ADV<br>ADI<br>APP<br>APS |  |
| ADV<br>NAV 2.2.2                         | Appreciate the effect of late change of runway-in-use for landing aircraft.                                   | 3 |   | ADV<br>ADI               |  |



**Subject 6 : AIRCRAFT**

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

**TOPIC ACFT 1 AIRCRAFT INSTRUMENTS**

| Subtopic          | ACFT 1.1 Aircraft instruments  |   |   |                   |
|-------------------|--|---|---|-------------------|
| ADV<br>ACFT 1.1.1 | Integrate <del>the information indication</del> from aircraft instruments provided by the pilot in the provision of ATS. | 4 | <del>Optional content: TCAS, wind shear indicator, weather radar</del>    | ALL               |
| ADV<br>ACFT 1.1.2 | Explain the operation of aircraft radio equipment.   | 2 | <del>Optional content: Radios (number of), emergency radios, SELCAL</del> | ALL               |
| ADV<br>ACFT 1.1.3 | <del>Explain the operation of on-board surveillance equipment.</del>   | 2 | <del>Transponders: equipment Mode A, Mode C, Mode S</del>                 | ADV<br>APP<br>ACP |
| ADV<br>ACFT 1.1.4 | <del>Explain the use and benefits of CPDLC.</del>  | 2 |   | ALL               |

**TOPIC ACFT 2 AIRCRAFT CATEGORIES**

| Subtopic          | ACFT 2.1 Wake turbulence <del>categories</del>  |   |  |     |
|-------------------|---|---|--|-----|
| ADV<br>ACFT 2.1.1 | Explain the wake turbulence effect and associated hazards to the succeeding aircraft.                     | 2 |  | ALL |
| ADV<br>ACFT 2.1.2 | Appreciate the techniques used to prevent hazards associated with wake turbulence on succeeding aircraft. | 3 |  | ALL |

**TOPIC ACFT 3 FACTORS AFFECTING AIRCRAFT PERFORMANCE**

| Subtopic          | ACFT 3.1 Take-off factors  |   |  |            |
|-------------------|--|---|--|------------|
| ADV<br>ACFT 3.1.1 | Integrate the influence of factors affecting aircraft on take-off.                       | 4 | <del>Optional content: runway conditions, runway slope, aerodrome elevation, wind, temperature, aircraft configuration, airframe contamination and aircraft mass</del> | ADV<br>ADI |
| Subtopic          | ACFT 3.2 Climb factors   |   |  |            |
| ADV<br>ACFT 3.2.1 | Appreciate the influence of factors affecting aircraft during climb.                     | 3 | <del>Optional content: speed, mass, air density, wind and temperature</del>  | ADV<br>ADI |
| Subtopic          | ACFT 3.3 Final approach and landing factors  |   |  |            |
| ADV<br>ACFT 3.3.1 | Integrate the influence of factors affecting aircraft during final approach and landing. | 4 | <del>Optional content: wind, aircraft configuration, mass, runway conditions, runway slope, aerodrome elevation</del>  | ADV<br>ADI |
| Subtopic          | ACFT 3.4 Economic factors  |   |  |            |
| ADV<br>ACFT 3.4.1 | Integrate consideration of economic factors affecting aircraft.                          | 4 | <del>Optional content: Starting-up, Taxiing, Routing, Departure sequence</del>   | ADV<br>ADI |

| Subtopic ACFT 3.5 <del>Miscellaneous factors</del> |   |   |  |            |
|--|---|---|--|------------|
| ADV  | Appreciate the influence of operational requirements.   | 3 | <del>Optional content: Military flying, Calibration flights, Aerial photography, banner towing</del> | ADV<br>ADI |
| ACFT 3.5.1   |   |   |  |            |
| 10.1.5 ATM   |   |   |  |            |
| Subtopic ACFT 3.5 Environmental factors            |   |   |  |            |
| ADV  | Appreciate the performance restrictions due to environmental constraints.   | 3 | Optional content: Noise abatement procedures, Minimum flight altitudes, Bird hazard                  | ADV<br>ADI |
| ACFT 3.5.1   |   |   |  |            |
| 3.6.1  | <del>Estimate the influence of ecological factors affecting aircraft.</del>   |   |  |            |
| TOPIC ACFT 4 AIRCRAFT DATA                         |   |   |  |            |
| Subtopic ACFT 4.1 Recognition of aircraft types    |   |   |  |            |
| ADV  | Characterise a representative sample of aircraft which will be encountered in the operational/working environment.  | 2 | Recognition, ICAO type designators, Wake Turbulence Categories                                       | ADV        |
| ACFT 4.1.1   |   |   | <del>Optional content: ICAO Approach Categories</del>  |            |
| Subtopic ACFT 4.2 Performance data                 |   |   |  |            |
| ADV  | Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/working environment into the provision of a control service. | 4 | Performance data under a representative variety of circumstances                                     | ADV<br>ADI |
| ACFT 4.2.1   |   |   |  |            |
| ADV  | <del>Identify potential or actual emergency situations.</del>   | 3 |  | ADV<br>ADI |
| ACFT 4.2.2   |   |   |  |            |
| 1.1.2 ABES   |   |   |  |            |

## Subject 7 : HUMAN FACTORS

The subject objective is:

Learners shall ~~+~~ recognise the necessity to constantly extend their knowledge ~~+~~ and ~~+~~ analyse factors which affect personal and team performance.

### TOPIC HUM 1 PSYCHOLOGICAL FACTORS

| Subtopic         | HUM 1.1 Cognitive  |   |   |     |
|------------------|--|---|---|-----|
| ADV<br>HUM 1.1.1 | Describe the human information processing model.                               | 2 | Attention, perception, memory, situational awareness, decision making, response                                   | ALL |
| ADV<br>HUM 1.1.2 | Describe the factors which influence human information processing.             | 2 | Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations | ALL |
| ADV<br>HUM 1.1.3 | Monitor the effect of human information processing factors on decision making. | 3 | Optional content: workload, stress, interpersonal relations, distraction, confidence                              | ALL |

### TOPIC HUM 2 MEDICAL AND PHYSIOLOGICAL FACTORS

| Subtopic         | HUM 2.1 Fatigue   |   |   |     |
|------------------|---|---|---|-----|
| ADV<br>HUM 2.1.1 | State factors that cause fatigue.   | 1 | Shift work<br><br>Optional content: night shifts and rosters  | ALL |
| ADV<br>HUM 2.1.2 | Describe the onset of fatigue.  | 2 | Optional content: Lack of concentration, Listlessness, Irritability, Frustration, ICAO Circular 241 – AN/145 Human factors in Air Traffic Control | ALL |
| ADV<br>HUM 2.1.3 | Recognise the onset of fatigue in self.                                   | 1 | Optional content: ICAO Circular 241 – AN/145 Human factors in Air Traffic Control   | ALL |
| ADV<br>HUM 2.1.4 | Recognise the onset of fatigue in others.                                 | 1 |   | ALL |
| ADV<br>HUM 2.1.5 | Describe <del>Consider</del> appropriate action when recognising fatigue. | 2 |   | ALL |

| Subtopic         | HUM 2.2 Fitness  |   |  |     |
|------------------|--|---|--|-----|
| ADV<br>HUM 2.2.1 | Recognise signs of lack of personal fitness.               | 1 |  | ALL |
| ADV<br>HUM 2.2.2 | Describe actions when aware of a lack of personal fitness. | 2 |  | ALL |

### TOPIC HUM 3 SOCIAL AND ORGANISATIONAL FACTORS

| Subtopic | HUM 3.1 Team resource management (TRM) |  |  |  |
|----------|--|--|--|--|
|----------|--|--|--|--|

|   |   |   |  |     |
|---|---|---|--|-----|
| ADV<br>HUM 3.1.1                                | State the <b>relevance objectives</b> of TRM.   | 1 | <i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>                                      | ALL |
| ADV<br>HUM 3.1.2                                | State the content of the TRM concept.   | 1 | <i>Optional content: team work, human error, team roles, stress, decision making, communication, situational awareness</i>           | ALL |
| <b>Subtopic HUM 3.2 Teamwork and team roles</b> |   |   |  |     |
| ADV<br>HUM 3.2.1                                | Identify reasons for conflict.  | 3 |  | ALL |
| ADV<br>HUM 3.2.2                                | Describe actions to prevent human conflicts.  | 2 | <i>Optional content: TRM team roles</i>  | ALL |
| ADV<br>HUM 3.2.3                                | Describe strategies to cope with human conflicts.   | 2 | <i>Optional content: in your team, in the simulator</i>  | ALL |
| <b>Subtopic HUM 3.3 Responsible behaviour</b>   |   |   |  |     |
| ADV<br>HUM 3.3.1                                | Consider the factors which influence responsible behaviour.   | 2 | <i>Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality</i> | ALL |
| ADV<br>HUM 3.3.2                                | Apply responsible judgement.  | 3 | Case study and discussion about a dilemma situation  | ALL |
| <b>TOPIC HUM 4 STRESS</b>                       |   |   |  |     |
| <b>Subtopic HUM 4.1 Stress</b>                  |   |   |  |     |
| ADV<br>HUM 4.1.1                                | Recognise the effects of stress on performance.   | 1 | Stress and its symptoms in self and in others  | ALL |
| <b>Subtopic HUM 4.2 Stress management</b>       |   |   |  |     |
| ADV<br>HUM 4.2.1                                | Act to reduce stress.   | 3 | The effect of personality in coping with stress, The benefits of active stress management  | ALL |
| ADV<br>HUM 4.2.2                                | Respond to stressful situation by offering, asking or accepting assistance. <del>Obtain assistance in stressful situations.</del> | 3 | <i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i>                             | ALL |
| ADV<br>HUM 4.2.3                                | Recognise the effect of shocking and stressful events.  | 1 | Self and others, Abnormal situations, CISM   | ALL |
| ADV<br>HUM 4.2.4                                | Consider the benefits of Critical Incident Stress Management (CISM).  | 2 |  | ALL |
| ADV<br>HUM 4.2.5                                | Explain procedures used following an incident/accident.   | 2 | <i>Optional content: CISM, Counselling, Human element</i>  | ALL |

| TOPIC HUM 5 HUMAN ERROR     |  |   |  |     |  |
|-----------------------------|--|---|--|-----|--|
| Subtopic                    | HUM 5.1 Human error  |   |  |     |  |
| ADV HUM 5.1.1               | Explain the relationship between error and safety.   | 2 | Number and combination of errors, proactive versus reactive approach to discovery of error<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |  |
| ADV HUM 5.1.2               | Differentiate between the types of error.  | 2 | Slips, Lapses, Mistakes<br><br><i>Optional content: <del>Slips, Lapses, Mistakes</del> ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>                                 | ALL |  |
| ADV HUM 5.1.3               | Describe error-prone conditions.   | 2 | <i>Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences</i>  | ALL |  |
| ADV HUM 5.1.4               | Collect examples of different error types, their causes and consequences in ATC.   | 3 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |  |
| ADV HUM 5.1.5               | Explain how to detect errors to compensate for them.   | 2 | STCA, MSAW, individual and collective strategy<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |  |
| ADV HUM 5.1.6               | Execute corrective actions.  | 3 | Error compensation<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |  |
| ADV HUM 5.1.7               | Explain the importance of error management.  | 2 | <i>Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practises</i>  | ALL |  |
| ADV HUM 5.1.8               | Describe the impact on an ATCO following an occurrence/incident.   | 2 | <i>Optional content: reporting, SMS, investigation, CISM</i>   | ALL |  |
| Subtopic                    | HUM 5.2 Violation of rules   |   |  |     |  |
| ADV HUM 5.2.1               | Explain the causes and dangers of violation of rules becoming accepted as a practice.  | 2 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |  |
| TOPIC HUM 6 WORKING METHODS |  |   |  |     |  |
| Subtopic                    | HUM 6.1 Efficiency   |   |  |     |  |
| ADV HUM 6.1.1               | <del>Consider, from a human factors point of view, the factors affecting efficiency in the provision of air traffic control.</del> | 2 | <del><i>Optional content: Own and others workload, OJT, customer requirements, economy, ecology, safety</i></del>  | ALL |  |

**TOPIC HUM 6 COLLABORATIVE WORK**

| <b>Subtopic HUM 6.1 Communication</b>  |  |   |  |     |
|--|--|---|--|-----|
| ADV  | Use communication effectively in ATC.  | 3 |  | ALL |
| HUM 6.1.1  |  |   |  |     |
| 8.1.1  |  |   |  |     |
| ADV  | Analyse examples of pilot and controller communication for effectiveness.                                    | 4 |  | ALL |
| HUM 6.1.2  |  |   |  |     |
| 2.1.3 ATM  |  |   |  |     |
| <b>Subtopic HUM 6.2 Collaborative work within the same area of responsibility</b>    |  |   |  |     |
| ADV  | List communication means between controllers in charge of the same area of responsibility (sector or tower). | 1 | Optional content: Electronic, written, verbal and non-verbal communication       | ALL |
| HUM 6.2.1  |  |   |  |     |
| 8.2.1  |  |   |  |     |
| ADV  | Explain consequences of the use of communication means on effectiveness.                                     | 2 | Optional content: Strips legibility and encoding, labels designation, Feedback   | ALL |
| HUM 6.2.2  |  |   |  |     |
| 8.2.2  |  |   |  |     |
| ADV  | List possible actions to provide a safe position handover.   | 1 | Optional content: rigour, preparation, overlap time                              | ALL |
| HUM 6.2.3  |  |   |  |     |
| 8.2.3  |  |   |  |     |
| ADV  | Explain consequences of a missed position handover process.  | 2 |  | ALL |
| HUM 6.2.4  |  |   |  |     |
| 8.2.4  |  |   |  |     |
| <b>Subtopic HUM 6.3 Collaborative work between different areas of responsibility</b> |  |   |  |     |
| ADV  | List factors and means for an effective coordination between sectors and/or tower positions.                 | 1 | Optional content: Other sectors constraints, electronic coordination tools       | ALL |
| HUM 6.3.1  |  |   |  |     |
| 8.3.1  |  |   |  |     |
| <b>Subtopic HUM 6.4 Controller / pilot cooperation</b>                               |  |   |  |     |
| ADV  | Describe parameters affecting controller/pilot cooperation.  | 2 | Optional content: workload, mutual knowledge, controller vs pilot mental picture | ALL |
| HUM 6.4.1  |  |   |  |     |
| 8.4.1  |  |   |  |     |

**TOPIC HUM 7 ~~WORKING KNOWLEDGE~~**

| <b>Subtopic HUM 7.1 <del>Controller knowledge</del></b> |  |   |  |     |
|---|--|---|--|-----|
| ADV   | Explain how to maintain and update professional knowledge to retain competence in the operational environment. | 2 | <del>Optional content: Briefing, LOAs, NOTAM, AICs, Reports of accident/incident, VOLMET, ATIS, SIGMET</del> | ALL |
| HUM 7.1.1   |  |   |  |     |
| 1.1.2 LAW   |  |   |  |     |

**TOPIC HUM 9 ~~WORK ENVIRONMENT~~**

| <b>Subtopic HUM 9.1 <del>Ergonomics</del></b> |   |   |  |     |
|---|---|---|--|-----|
| ADV   | <del>Appreciate the impact of working position ergonomics on controller activity.</del> | 3 |  | ALL |
| HUM 9.1.1                                     |   |   |  |     |

| TOPIC HUM 10 ATC SAFETY MANAGEMENT |  |   |  |  |     |
|------------------------------------|--|---|--|--|-----|
| Subtopic                           | HUM 10: <b>Experience feedback</b>   |   |  |  |     |
| ADV<br>HUM 10.1.1<br>3.1.1 LAW     | State the importance of the controllers contribution to the experience feedback process. | 1 | <i>Optional content: voluntary reporting</i>   |  | ALL |
| ADV<br>HUM 10.1.2<br>3.1.2 LAW     | Describe how reported occurrences are analysed.  | 2 | <i>Optional content: ESARR2, local procedures</i>  |  | ALL |
| ADV<br>HUM 10.1.3<br>3.1.3 LAW     | Name the means used to disseminate recommendations.                                      | 1 | <i>Optional content: Safety letters, safety boards web pages</i>                                 |  | ALL |
| ADV<br>HUM 10.1.4<br>3.1.4 LAW     | Explain the "Just Culture" concept.  | 2 | <b>benefits, prerequisites, constraints</b><br><i>Optional content: EAM 2 GUI 6, GAIN Report</i> |  | ALL |
| Subtopic                           | HUM 10: <b>Safety investigation branch</b>   |   |  |  |     |
| ADV<br>HUM 10.2.1<br>3.2.1 LAW     | Describe role and mission of Safety Investigation Branch in the improvement of safety.   | 2 |  |  | ALL |
| ADV<br>HUM 10.2.2<br>3.2.2 LAW     | Define working methods of Safety Investigation Branch.                                   | 1 |  |  | ALL |

## Subject 8 : EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall ~~+~~ integrate knowledge and understanding of the basic working principles of equipment and systems and ~~it~~ comply with the equipment and system degradation procedures in the provision of ATS.

### TOPIC EQPS 1 VOICE COMMUNICATIONS

| Subtopic          | EQPS 1.1   | Radio communications       |  |     |  |
|-------------------|--|----------------------------|--|-----|--|
| ADV<br>EQPS 1.1.1 | Operate two-way communication equipment.                       | 3                          | Transmit/receive switches, Procedures  | ALL |  |
|                   |  |                            | Optional content: Frequency selection, Standby equipment                                 |     |  |
| ADV<br>EQPS 1.1.2 | Identify indications of operational status of radio equipment. | 3                          | Optional content: Indicator lights, Serviceability displays, Selector/frequency displays | ALL |  |
| Subtopic          | EQPS 1.2   | Other voice communications |  |     |  |
| ADV<br>EQPS 1.2.1 | Operate landline communications.                               | 3                          | Optional content: telephone, interphone and intercom equipment                           | ALL |  |

### TOPIC EQPS 2 AUTOMATION IN ATS

| Subtopic          | EQPS 2.1  | Aeronautical fixed telecommunication network (AFTN) |  |                          |  |
|-------------------|---|---|--|--------------------------|--|
| ADV<br>EQPS 2.1.1 | Decode AFTN messages.   | 3   | Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.     | ALL                      |  |
| Subtopic          | EQPS 2.2  | Automatic data Interchange                          |  |                          |  |
| ADV<br>EQPS 2.2.1 | Use automatic data transfer equipment where available.                                      | 3   | Optional content: Sequencing systems, Automated information and coordination, OLDI | ADV<br>ADI<br>APS<br>ACS |  |
| ADV<br>EQPS 2.2.2 | Explain operational application of CPDLC for departure clearance (DCL) delivery and D-ATIS. | 2   | ICAO Doc 9694  | ADV<br>ADI               |  |

### TOPIC EQPS 3 CONTROLLER WORKING POSITION

| Subtopic          | EQPS 3.1   | Operation and monitoring of equipment      |  |     |  |
|-------------------|--|--|--|-----|--|
| ADV<br>EQPS 3.1.1 | Monitor the technical integrity of the controller working position.  | 3  | Notification procedures, Responsibilities  | ALL |  |
| ADV<br>EQPS 3.1.2 | Operate the equipment of the controller working position.  | 3  | Optional content: Situation displays, Flight progress board, Flight data display, Radio, Telephone, Maps and charts, Strip-printer, Clock, Information systems monitors, (CCIS), UDF/VDF | ALL |  |
| ADV<br>EQPS 3.1.3 | Operate <del>all</del> available equipment in <del>unusual/degraded</del> abnormal and emergency situations. | 3  |  | ALL |  |
| Subtopic          | EQPS 3.2   | Situation displays and information systems |  |     |  |



|                              |  |   |  |            |
|------------------------------|--|---|--|------------|
| ADV<br>EQPS 3.2.1            | Use situation displays.                              | 3 |  | ALL        |
| ADV<br>EQPS 3.2.2            | Check availability of information material.          | 3 |  | ALL        |
| ADV<br>EQPS 3.2.3            | Obtain information from equipment.                   | 3 | <i>Optional content: information from wind direction indicator</i> | ADV<br>ADI |
| ADV<br>EQPS <del>3.2.4</del> | <del>Take account of anti-incursion equipment.</del> | 2 |  | ADV        |

| Subtopic          | EQPS 3.3 Flight data systems                                    |   |  |     |
|-------------------|---|---|--|-----|
| ADV<br>EQPS 3.3.1 | Use the flight data information at controller working position. | 3 |  | ALL |

## TOPIC EQPS 4 FUTURE EQUIPMENT

| Subtopic          | EQPS 4.1 New developments      |   |                      |     |
|-------------------|--------------------------------|---|----------------------|-----|
| ADV<br>EQPS 4.1.1 | Recognise future developments. | 1 | New advanced systems | ALL |

## TOPIC EQPS 5 EQUIPMENT AND SYSTEMS LIMITATIONS AND DEGRADATION

| Subtopic          | EQPS 5.1 Reaction to limitations                               |   |   |     |
|-------------------|--|---|---|-----|
| ADV<br>EQPS 5.1.1 | Take account of the limitations of equipment and systems.      | 2 |   | ALL |
| ADV<br>EQPS 5.1.2 | Respond to technical deficiencies of the operational position. | 3 | Notification procedures, Responsibilities | ALL |

| Subtopic          | EQPS 5.2 Communication equipment degradation  |   |  |            |
|-------------------|---|---|--|------------|
| ADV<br>EQPS 5.2.1 | Identify that communication equipment has degraded.                                   | 3 | <i>Optional content: Ground-air, ground-ground and landline communications</i>   | ADV<br>ADI |
| ADV<br>EQPS 5.2.2 | Integrate contingency procedures in the event of communication equipment degradation. | 4 | <i>Optional content: total or partial degradation of ground-air, ground-ground and landline communications; Alternative methods of transferring data</i> | ADV<br>ADI |

| Subtopic                     | EQPS 5.3 Navigational equipment degradation   |   |   |     |
|------------------------------|---|---|---|-----|
| ADV<br>EQPS 5.3.1            | Identify when a navigational equipment failure will affect operational ability.                   | 3 | <i>Optional content: VOR, Navigational aids</i>   | ALL |
| ADV<br>EQPS <del>5.3.2</del> | <del>Integrate contingency procedures in the event of a navigational equipment degradation.</del> | 4 | <del><i>Optional content: Vertical separation; Information to aircraft; Navigational assistance; Seeking assistance from adjacent units</i></del> | ADV |

## Subject 9 : PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

| TOPIC PEN 1 FAMILIARISATION PROFESSIONAL ENVIRONMENT                                       |   |   |  |                          |  |
|--|---|---|--|--------------------------|--|
| Subtopic PEN 1.1 Study visit to aerodrome  |   |   |  |                          |  |
| ADV<br>PEN 1.1.1   | Appreciate the functions and provision of an operational aerodrome control service.   | 3 | study visit to TWR   | ADV<br>ADI               |  |
| TOPIC PEN 2 AIRSPACE USERS   |   |   |  |                          |  |
| Subtopic PEN 2.1 Contributors to civil ATS operations                                      |   |   |  |                          |  |
| ADV<br>PEN 2.1.1<br>1.1.1  | Characterise civil <del>and military</del> ATS activities at aerodrome.   | 2 | study visit to TWR<br><br><i>Optional content: Familiarisation visits to <del>e.g. TWR, APP, ACC, AIS, RCC, Air Defence Units</del></i>              | ADV<br>ADI               |  |
| ADV<br>PEN 2.1.2<br>1.1.2  | Characterise other parties interfacing with ATS operations.   | 2 | <i>Optional content: familiarisation visits to engineering services, fire and emergency services, airline operations offices</i>                     | ALL                      |  |
| Subtopic PEN 2.2 Contributors to military ATS operations                                   |   |   |  |                          |  |
| ADV<br>PEN 2.2.1<br>1.1.1  | Characterise <del>civil and</del> military ATS activities.  | 2 | <i>Optional content: Familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units</i>  | ALL                      |  |
| TOPIC PEN 3 CUSTOMER RELATIONS   |   |   |  |                          |  |
| Subtopic PEN 3.1 <del>Customer relations</del> Provision of services and user requirements |   |   |  |                          |  |
| ADV<br>PEN 3.1.1<br>1.2.1  | Identify the role of ATC as a service provider. <del>and the requirements of the ATS users.</del>   | 3 | <i>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</i> | ALL                      |  |
| ADV<br>PEN 3.1.2<br>1.2.1  | Appreciate ATS users requirements.  | 3 | <i>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</i> | ALL                      |  |
| TOPIC PEN 4 ENVIRONMENTAL PROTECTION   |   |   |  |                          |  |
| Subtopic PEN 4.1 Environmental protection  |   |   |  |                          |  |
| ADV<br>PEN 4.1.1   | Describe the environmental constraints on aerodrome operations.   | 2 | <i>Optional content: ICAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions</i>                                     | ADV<br>ADI<br>APP<br>APS |  |
| ADV<br>PEN 4.1.2<br>1.3.1  | Explain the use of Collaborative Environmental Management (CEM) process at airports. <del>Describe processes used to ensure environmental protection.</del> | 2 | <i>Optional content: night curfews, relations with local community, relations with environmental associations, relevant administrations</i>          | ADV<br>ADI<br>APP<br>APS |  |

---

|           |   |   |   |     |
|-----------|---|---|---|-----|
| ADV       | Appreciate the mitigation techniques used                       | 3 | Optional content: Noise abatement procedures, flight efficiency | ADV |
| PEN 4.1.3 | at aerodromes to minimise aviation's impact on the environment. |   |   | ADI |

---

## Subject 10: ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in ~~unusual, degraded~~-abnormal and emergency situations.

### TOPIC ABES 1 ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS (ABES)

| Subtopic                        | ABES 1.1 Overview of <del>UNUSUAL/DEGRADED</del> ABES   |   |   |            |
|---------------------------------|---|---|---|------------|
| ADV<br>ABES 1.1.1               | List common <del>unusual/degraded</del> -abnormal and emergency situations.   | 1 | Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, <del>GPWS</del> ground based safety nets alerts, airframe failure, unreliable instruments, runway incursion | ALL        |
| ADV<br>ABES 1.1.2<br>4.1.2 ACFT | Identify potential or actual abnormal and emergency situations.   | 3 |   | ALL        |
| ADV<br>ABES 1.1.3<br>1.1.2      | Take into account the procedures for given <del>unusual/degraded</del> -abnormal and emergency situations.            | 2 | Bird strike, aborted take-off<br>Optional content: ICAO Doc 4444  | ADV<br>ADI |
| ADV<br>ABES 1.1.4<br>1.1.3      | Take into account that procedures don't exist for all <del>unusual/degraded</del> -abnormal and emergency situations. | 2 | Optional content: real life examples  | ALL        |
| ADV<br>ABES 1.1.5<br>1.1.4      | Consider how the evolution of a situation may have an impact on safety.   | 2 | Optional content: Separation, Information, Coordination   | ALL        |

### TOPIC ABES 2 SKILLS IMPROVEMENT

| Subtopic          | ABES 2.1 Communication effectiveness   |   |   |     |
|-------------------|--|---|---|-----|
| ADV<br>ABES 2.1.1 | Ensure effective communication in all circumstances including the case where standard phraseology is not applicable. | 4 | Phraseology, Vocabulary, Readback, Silence instruction                        | ALL |
| ADV<br>ABES 2.1.2 | Apply change of radiotelephony call sign.  | 3 | ICAO Doc 4444   | ALL |
| Subtopic          | ABES 2.2 Avoidance of mental overload  |   |   |     |
| ADV<br>ABES 2.2.1 | Describe actions to keep the control of the situation.   | 2 | Optional content: sector splitting, holding, flow management, task delegation | ALL |
| ADV<br>ABES 2.2.2 | Organise priority of actions.  | 4 |   | ALL |

|   |  |   |   |     |
|---|--|---|---|-----|
| ADV<br>ABES 2.2.3   | Ensure an effective circulation of information.  | 4 | <i>Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.</i>                                 | ALL |
| ADV<br>ABES 2.2.4   | Consider asking for help.  | 2 |   | ALL |
| <b>Subtopic ABES 2.3 Air / ground cooperation</b>   |  |   |   |     |
| ADV<br>ABES 2.3.1   | Collect appropriate information relevant for the situation.  | 3 |   | ALL |
| ADV<br>ABES 2.3.2   | Assist the pilot.  | 3 | <b>Pilot workload</b><br><i>Optional content: Instructions, information, support, human factors, etc.</i>   | ALL |
| <b>TOPIC ABES 3 PROCEDURES FOR UNUSUAL/DEGRADED/ABNORMAL AND EMERGENCY SITUATIONS</b>                     |  |   |   |     |
| <b>Subtopic ABES 3.1 Application of procedures for UNUSUAL/DEGRADED/ABNORMAL AND EMERGENCY SITUATIONS</b> |  |   |   |     |
| ADV<br>ABES 3.1.1   | Apply the procedures for given unusual/degraded/abnormal and emergency situations.                     | 3 | <i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, GPWS ground based safety nets alerts, airframe failure</i> | ALL |
| <b>Subtopic ABES 3.2 Radio failure</b>  |  |   |   |     |
| ADV<br>ABES 3.2.1   | Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure. | 2 | <b>ICAO Doc 7030</b><br><i>Optional content: military procedures</i>  | ALL |
| ADV<br>ABES 3.2.2   | Apply the procedures to be followed when a pilot experiences complete or partial radio failure.        | 3 | <i>Optional content: Prolonged loss of communication</i>  | ALL |
| <b>Subtopic ABES 3.3 Unlawful interference and aircraft bomb threat</b>                                   |  |   |   |     |
| ADV<br>ABES 3.3.1   | Apply ATC procedures associated with unlawful interference and aircraft bomb threat.                   | 3 | <b>ICAO Doc 4444</b>  | ALL |
| <b>Subtopic ABES 3.4 Strayed or unidentified aircraft</b>   |  |   |   |     |
| ADV<br>ABES 3.4.1   | Apply the procedures in the case of strayed aircraft.  | 3 | <b>ICAO Doc 4444</b><br><i>Optional content: Inside controlled airspace, Outside controlled airspace</i>  | ALL |
| ADV<br>ABES 3.4.2   | Apply the procedures in the case of unidentified aircraft.   | 3 | <b>ICAO Doc 4444</b>  | ALL |

|   |  |   |  |            |
|---|--|---|--|------------|
| ADV<br>ABES 3.4.3                         | Provide navigational assistance to aircraft.           | 4 | <i>Optional content: diverted aircraft, aircraft lost or unsure of position, information derived locally or from radar service or from other pilots, Nearest most suitable aerodrome, Track, Heading, Distance, Aerodrome information, Any other relevant navigational assistance, ICAO Doc 4444, etc.</i> | ADV<br>ADI |
| <b>Subtopic ABES 3.5 Runway incursion</b> |  |   |  |            |
| ADV<br>ABES 3.5.1                         | Apply ATC procedures associated with runway incursion. | 3 | ICAO Doc 4444  | ADV<br>ADI |

## Subject 11: AERODROMES

The subject objective is:

Learners shall recognise and understand the design and layout of aerodromes.

### TOPIC AGA 1 AERODROME DATA, LAYOUT AND COORDINATION

| Subtopic                  | AGA 1.1 Definitions  |   |   |                          |
|---------------------------|--|---|---|--------------------------|
| ADV<br>AGA 1.1.1          | <del>Describe the general layout of an aerodrome with a single runway and multiple runways.</del>            | 2 | <del>ICAO Annex 14</del><br><del>Optional content: AIP</del>  | APP<br>APS<br>ADV<br>ADI |
| ADV<br>AGA 1.1.1<br>1.1.2 | Define aerodrome data.   | 1 | ICAO Annex 14<br><br>Optional content: Aerodrome elevation, Reference point, Apron, Movement area, Manoeuvring area, Hot spot | ADV<br>ADI<br>APP<br>APS |
| Subtopic                  | AGA 1.2 Coordination   |   |   |                          |
| ADV<br>AGA 1.2.1          | Identify the information that has to be passed between Air Traffic Services (ATS) and the airport authority. | 3 | Airport conditions, Fire/rescue category, Condition of ground equipment and NAVAIDs, AIRAC, ICAO Annex 14                     | APP<br>APS<br>ADV<br>ADI |

### TOPIC AGA 2 MOVEMENT AREA

| Subtopic         | AGA 2.1 Movement area   |   |   |                          |
|------------------|---|---|---|--------------------------|
| ADV<br>AGA 2.1.1 | Describe movement area.   | 2 | ICAO Annex 14                                 | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.1.2 | Describe the marking of obstacles and unusable or unserviceable areas.                          | 2 | Flags, Signs on pavement, Lights              | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.1.3 | Identify the information on conditions of the movement area that have to be passed to aircraft. | 3 | Essential information on aerodrome conditions | ADV<br>ADI<br>APP<br>APS |
| Subtopic         | AGA 2.2 Manoeuvring area  |   |   |                          |
| ADV<br>AGA 2.2.1 | Describe manoeuvring area.  | 2 | ICAO Annex 14                                 | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.2.2 | Describe taxiway.   | 2 |   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.2.3 | Describe the daylight marking on taxiways.  | 2 |   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.2.4 | Describe taxiway lighting.  | 2 |   | ADV<br>ADI<br>APP<br>APS |
| Subtopic         | AGA 2.3 Runways   |   |   |                          |

|                             |  |   |   |                          |
|-----------------------------|--|---|---|--------------------------|
| ADV<br>AGA 2.3.1            | Describe runway.   | 2 | Runway, Runway surface, Runway strip, Shoulder, Runway end safety areas, Clearways, Stopways                                  | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.2            | <del>Describe instrument runway.</del>                           | 2 | <del>ICAO Annex 14</del>  | ADV                      |
| ADV<br>AGA 2.3.2<br>2.3.3   | Describe non-instrument runway.                                  | 2 | ICAO Annex 14   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.3<br>2.3.4   | Explain declared distances.                                      | 2 | TORA, TODA, ASDA, LDA   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.4<br>2.3.5   | Explain the differences between ACN and PCN.                     | 2 | Strength of pavements   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.5<br>2.3.6   | Describe the daylight markings on runways.                       | 2 | Optional content: Runway Designator, Centre line, Threshold, Aiming point, Fixed distance, Touchdown zone, Side strip, Colour | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.6<br>2.3.7   | Describe runway lights.  | 2 | Optional content: Colour, Centre line, Intensity, Edge, Touchdown zone, Threshold, Barettes                                   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.7<br>2.3.8   | Explain the functions of visual landing aids.                    | 2 | Optional content: AVASI, VASI, PAPI   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.8<br>2.3.9   | Describe the approach lighting systems.                          | 2 | Centre line, cross bars, Stroboscopic lights, Colours, Intensity and brightness   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.9<br>2.3.10  | Characterise the effect of water/ice on runways.                 | 2 |   | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.10<br>2.3.11 | Explain braking action.  | 2 | Braking action coefficient  | ADV<br>ADI<br>APP<br>APS |
| ADV<br>AGA 2.3.11<br>2.3.12 | Explain the effect of runway visual range on aerodrome operation | 2 |   | ADV<br>ADI<br>APP<br>APS |

## TOPIC AGA 3 OBSTACLES

| Subtopic         | AGA 3.1 Obstacle-free airspace around aerodromes  |   |  |                          |
|------------------|---|---|--|--------------------------|
| ADV<br>AGA 3.1.1 | Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes. | 2 |  | ADV<br>ADI<br>APP<br>APS |



| TOPIC AGA 4 MISCELLANEOUS EQUIPMENT |   |   |  |                          |
|-------------------------------------|---|---|--|--------------------------|
| Subtopic                            | AGA 4.1 Location  |   |  |                          |
| ADV<br>AGA 4.1.1                    | Explain the location of different aerodrome ground equipment. | 2 | Optional content: LLZ, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI | ADV<br>ADI<br>APP<br>APS |

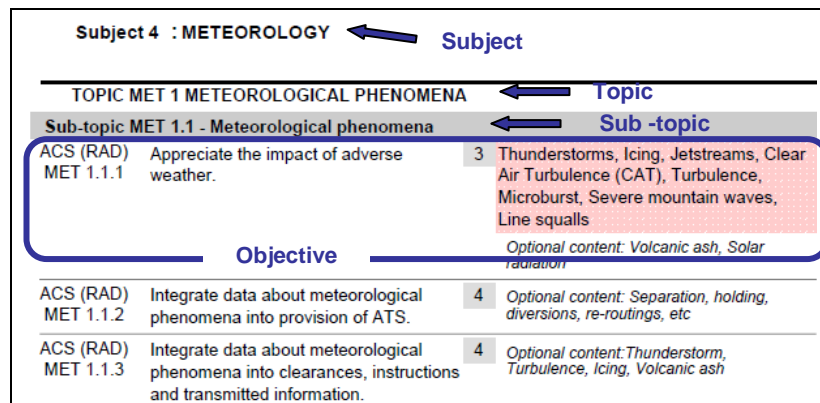
## Supplements

## Supplement 1

### SYLLABI STRUCTURE - HOW TO READ THE TABLES

#### 1. Structure of the Rating training syllabi

- a. Each Rating training has been structured as a syllabus, as follows:
  - i. Each syllabus is divided into subjects, which are divided into topics that are in turn divided into sub-topics. This structure is used to create and classify the objectives. There can be one or several objectives linked to each sub-topic.
  - ii. Objectives are assigned to a specific subject which deals with the knowledge and skills needed to accomplish the subject objective contained in Appendix 4 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(i) Aerodrome Control Visual Rating — ADV)



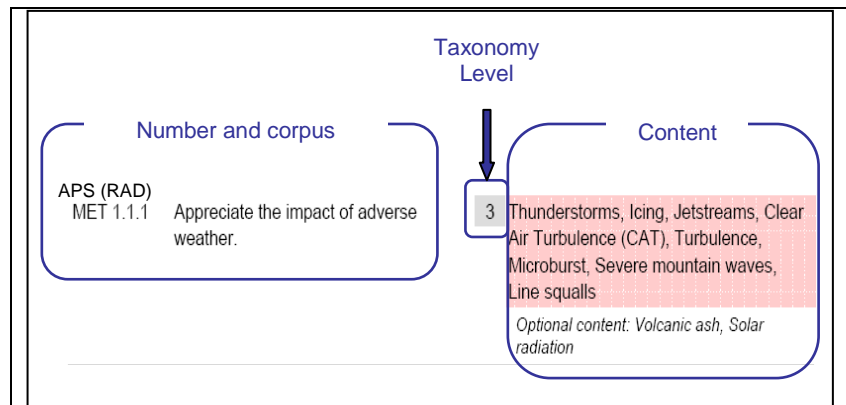
**Figure 1: Layout of syllabus**

- b. The following principles may be applied to the development of a training course that is based on any of the syllabi:
  - i. The structure of the syllabi and the order of the objectives contained within Appendix 4 to Regulation (EU) No .../... is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.
  - ii. No objective from the Basic syllabus is repeated as 'a refresher' in the Rating syllabi.
  - iii. The number of objectives contained within a sub-topic does not necessarily signify how long it should take to teach that sub-topic. For example, a sub-topic containing five relatively straightforward objectives, may take a shorter time to be taught than another sub-topic containing two complex objectives.

#### 2. Structure of objectives

- a. An objective consists of three elements:
  - i. The corpus, which is a description of the required performance. It always contains an action verb to ensure that the outcome is observable. The action verb is always associated with a defined taxonomy.

- ii. The level, which indicates numerically the taxonomy of the action verb.
- iii. The content, which may be implicit or explicit. The explicit content is written in the content field, while the implicit content is not but, instead, is implied in the corpus of the objective and other elements (syllabus, subject, etc.). Content that is a required part of the objective is written in the red shaded field. Optional content, written in italics, may be used if considered appropriate.



**Figure 2: Layout of an objective**

### 3. Repeated and common objectives

- a. Repeated and common objectives are only applicable to Rating training.
- b. To the right of each objective there is an indication of which other ratings contain this particular objective. This indication is the first step to help the training providers in identifying the potential commonalities between the various syllabi. As a second step, the training provider must determine, at the level of local implementation, whether the objective is to be regarded as repeated or common.

| TOPIC MET 1 - METEOROLOGICAL PHENOMENA      |  |   |   |                          |
|---|--|---|---|--------------------------|
| Subtopic MET 1.1 - Meteorological phenomena |  |   |   |                          |
| APS<br>MET 1.1.1                            | Appreciate the impact of adverse weather.                            | 3 | Thunderstorms, Icing, Clear Air Turbulence (CAT), Turbulence, Microburst, Wind shear, Severe mountain waves, Line squalls, Volcanic ash | APP<br>APS               |
| APS<br>MET 1.1.2                            | Integrate data about meteorological phenomena into provision of ATS. | 4 | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena</i>                      | ALL                      |
| APS<br>MET 1.1.3                            | Use techniques to avoid adverse weather when necessary/possible.     | 3 | Rerouting, level change, etc.   | APP<br>ACP<br>APS<br>ACS |

**Figure 3: Indication of the ratings that particular objective applies to.**

### 3.1 Repeated objectives

- a. All the objectives appearing in a syllabus are implicitly appropriate to this syllabus. As a consequence, objectives may be repeated 'verbatim' in different rating syllabi and nevertheless specify a different performance. The reader always needs to mentally add the sentence 'in this syllabus context' at the end of each objective.

*For example, the objective 'use approved phraseology' is repeated (same level, same corpus, same content) in all the syllabi but is different because the context is different in each syllabus (a learner able to use approved phraseology for en-route traffic will need additional training before mastering the phraseology in the provision of aerodrome control).*

### 3.2 Common objectives

- a. Common objectives are verbatim the same objectives that appear in more than one rating syllabi in the same context so that they do not need to be taught again in case of combined or successively organised courses.

*For example, the objective 'describe the human information processing model' is common for all the syllabi because the context is non-specific and is therefore not determined by the type of rating.*

- b. As a general principle, the rating subject Human Factors is identical in each Rating training syllabi and can be considered as containing common objectives because the context is always the same. This means that the rating training objectives relating to Human Factors need only be taught once. If a learner is acquiring an additional rating, he/she would not be required to repeat the Human Factors objectives.

4. **Action verbs that support the Taxonomy for training objectives:**

- a. The five taxonomy levels should be understood to have the following levels of complexity:
- b. Action verbs for Level 1

Level 1 - A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

| <b>L1 Verb</b>   | <b>Definition</b>  | <b>Example</b>   |
|------------------|--|--|
| <b>Define</b>    | State what it is and what its limits are; state the definition | Define ATC service   |
| <b>Draw</b>      | Produce a picture, pattern or diagram                          | Draw the block diagram<br>Draw a holding pattern   |
| <b>List</b>      | Say one after the other  | List the main structure components of an aircraft  |
| <b>Name</b>      | Give name of objects or procedures                             | Name the components of an ILS<br>Name the key national and international aviation organisations. |
| <b>Quote</b>     | Repeat of what is written or said to underline                 | Quote ICAO definition of ATC service   |
| <b>Recognise</b> | To know what it is because you've seen it before               | Recognise the information contained in the different parts of the AIP.                           |
| <b>State</b>     | Say or write in a formal or definite way                       | State the meteorological hazards to aviation.  |

c. Action verbs for Level 2

Level 2 - The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

| <b>L2 Verb</b>      | <b>Definition</b>   | <b>Example</b>  |
|---------------------|---|---|
| <b>Characterise</b> | To describe the quality of features in something                                  | Characterise the main items of ATC equipment                            |
| <b>Consider</b>     | To think carefully about it   | Consider the benefits of Critical Incident Stress Management (CISM).    |
| <b>Demonstrate</b>  | Describe and explain; logically or mathematically proves the truth of a statement | Demonstrate the importance of good communications in ATC.               |
| <b>Describe</b>     | Say what it is like or what happened  | Describe the methods by which ICAO notifies and implements legislation. |

|                        |   |  |
|------------------------|---|--|
| <b>Differentiate</b>   | Show the differences between things                                   | Differentiate between different types of visibility.   |
| <b>Explain</b>         | Give details about something or describe so that it can be understood | Explain the purpose and function of ICAO   |
| <b>Take account of</b> | Take into consideration before deciding                               | Take into account the wind influence when calculating a ground speed.<br>Take account of the limitations of equipment and systems. |

## d. Action verbs for Level 3

Level 3 - A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

| <b>L3 Verb</b>    | <b>Definition</b>   | <b>Example</b>   |
|-------------------|---|--|
| <b>Act</b>        | Carry out, execute  | Act to reduce stress.  |
| <b>Apply</b>      | Use something in a situation or activity  | Apply separation.  |
| <b>Appreciate</b> | To understand a situation and know what is involved in a problem-solving situation, to state a plan without applying it                                 | Appreciate the necessity for coordination. (The learner says that the coordination will be done and with whom, he/she does not perform the actual coordination). |
| <b>Assist</b>     | Help somebody to do a job by doing part of it   | Assist the pilot   |
| <b>Calculate</b>  | To discover from information you already have by arithmetic; to think about a possible cause of action in order to form an opinion or decide what to do | Calculate appropriate levels<br>Calculate conversions between the three north designations.  |
| <b>Check</b>      | Make sure the information is correct (satisfactory)   | Check the accuracy of flight data information<br>Check availability of information material.   |
| <b>Choose</b>     | Select out of number, decide to do one thing rather than another  | Choose appropriate levels.<br>Choose which aircraft should be vectored   |
| <b>Collect</b>    | Assemble, accumulate, bring or come together  | Collect examples of different types of error, their causes and consequences in ATC.  |
| <b>Conduct</b>    | Lead, guide   | Conduct coordination   |
| <b>Confirm</b>    | Establish more firmly, corroborate  | Confirm sequence order   |
| <b>Decode</b>     | Turn into ordinary writing, decipher  | Decode the content of weather reports and forecast   |
| <b>Encode</b>     | Put into code or cipher   | Encode and decode flight plans (including supplementary information).  |
| <b>Estimate</b>   | Form an approximate judgement of a number, form an opinion  | Estimate distance and direction between two points   |
| <b>Execute</b>    | Perform action  | Execute corrective actions.  |
| <b>Extract</b>    | Copy out, make extracts   | Extract pertinent data from relevant sources to produce a flight progress  |

Page 7 of 17



| L3 Verb         | Definition  | Example   |
|-----------------|---|---|
|                 | from, find, deduce  | display.  |
| <b>Identify</b> | Associate oneself inseparably with, establish the identity  | Identify the role of ATC as a service provider and the requirements of the ATS users.<br>Identify an aircraft |
| <b>Inform</b>   | Inspire, tell   | Inform supervisor of situation.   |
| <b>Initiate</b> | Begin, set going, originate   | Initiate appropriate coordination   |
| <b>Input</b>    | Enter in the system   | Input data  |
| <b>Issue</b>    | Send forth, publish   | Issue appropriate ATC clearances.<br>Issue appropriate traffic information.                                   |
| <b>Maintain</b> | Carry on, keep up, refresh  | Maintain flight data display  |
| <b>Measure</b>  | Ascertain extent or quality of (thing) by comparison with fixed unit or with object of known size | Measure distance on a map   |
| <b>Monitor</b>  | Keep under observation  | Monitor traffic<br>Monitor the effect of human information processing factors on decision making.             |
| <b>Notify</b>   | Make known, announce, report  | Notify runway in use  |
| <b>Obtain</b>   | Acquire easily, without research  | Obtain meteorological information<br>Obtain information from the relieving controller.                        |
| <b>Operate</b>  | Conduct work on equipment   | Operate the equipment of the controller working position.   |
| <b>Pass</b>     | Move, cause to go, transmit   | Pass essential traffic information without delay  |
| <b>Perform</b>  | Carry into effect, go through, execute  | Perform communication effectively   |
| <b>Process</b>  | To put through the steps of a prescribed procedure  | Process pertinent data on data displays.  |
| <b>Record</b>   | Register, set down for remembrance or reference   | Record information by writing effectively   |
| <b>Relay</b>    | Arrange in, provide with, replace by ...  | Relay meteorological information from pilot reports.  |
| <b>Respond</b>  | Make answer, perform answering or corresponding action  | Respond to loss/doubt concerning identification.<br>Respond to distress and urgency messages and signals.     |
| <b>Scan</b>     | Continuously observe rapidly, sequentially and  | Scan data display   |

| L3 Verb         | Definition   | Example  |
|-----------------|--|--|
|                 | selectively in order to extract relevant data                  |  |
| <b>Transfer</b> | Hand over  | Transfer information to the relieving controller                       |
| <b>Update</b>   | Refresh, bring up-to-date                                      | Update the data display to accurately reflect the traffic situation.   |
| <b>Use</b>      | Employ for a purpose, handle as instrument, put into operation | Use approved phraseology.<br>Use the available means for coordination. |
| <b>Verify</b>   | Establish truth of   | Verify the mode C information  |

## e. Action verbs for Level 4

Level 4 - Ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problem situation. This involves the integration of known applications in a familiar situation.

| L4 Verb           | Definition   | Example   |
|-------------------|--|---|
| <b>Acquire</b>    | Gain by oneself and for oneself, obtain after research | Acquire relevant aeronautical information   |
| <b>Adjust</b>     | Change to a new position, value or setting             | Adjust the surveillance system display  |
| <b>Allocate</b>   | Assign, devote   | Allocate levels (height, altitude, flight level) according to altimetry data.   |
| <b>Analyse</b>    | Examine minutely the constitution of                   | Analyse examples of pilot and controller communication for effectiveness.<br>Analyse the information provided by the radar equipment. |
| <b>Assign</b>     | Allot as a share, make over                            | Assign codes.   |
| <b>Coordinate</b> | Bring part into proper relation                        | Coordinate runway in use.<br>Coordinate in the provision of FIS.  |
| <b>Comply</b>     | Act in accordance with                                 | Comply with rules   |
| <b>Delegate</b>   | Commit authority to somebody                           | Delegate separation to pilots in the case of aircraft executing successive visual approaches.   |
| <b>Detect</b>     | Discover existence of                                  | Detect potential conflict   |
| <b>Ensure</b>     | Make safe, make certain                                | Ensure the agreed course of action is carried out   |
| <b>Expedite</b>   | Assist the progress of, do speedily                    | Expedite traffic  |

| L4 Verb          | Definition  | Example  |
|------------------|---|--|
| <b>Integrate</b> | Combine into a whole, complete by addition of parts         | Integrate appropriate ATC clearances in control service.   |
| <b>Manage</b>    | Handle, wield, conduct                                      | Manage traffic on the manoeuvring area.<br>Manage traffic in accordance with procedural changes. |
| <b>Organise</b>  | Give orderly structure to, frame and put into working order | Organise pertinent data on data displays.<br>Organise priority of actions.                       |
| <b>Predict</b>   | Forecast  | Predict positions of aircraft in the aerodrome traffic and taxi circuits.                        |
| <b>Provide</b>   | Supply, furnish   | Provide radar separation.<br>Provide FIS.  |
| <b>Relate</b>    | Establish link with   | Relate a pressure setting to an altitude   |

## f. Action verbs for Level 5

Level 5 - Ability to analyse new situation in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different from those previously met, requiring judgement and evaluation of options.

| L5 verb          | Definition   | Example   |
|------------------|--|---|
| <b>Assess</b>    | Estimate value or difficulty, evaluate, appraise                                     | Assess workload   |
| <b>Balance</b>   | Weigh (a question, two arguments, etc., against each other)                          | Balance the workload with the traffic demand.   |
| <b>Discuss</b>   | Investigate by reasoning or argument   | Discuss the impact of regulation.   |
| <b>Evaluate</b>  | Ascertain amount of, find numerical expression for                                   | Evaluate the necessary information to be provided to pilots in need of navigational assistance. |
| <b>Interpret</b> | To decide on something's meaning or significance when there is a choice              | Interpret operational information.  |
| <b>Optimise</b>  | To make optimal; get the most out of; use best; modify to achieve maximum efficiency | Optimise the use of support tools.  |
| <b>Resolve</b>   | Solve, clear up, settle  | Resolve conflict  |
| <b>Select</b>    | Pick out as best or most suitable  | Select the runway in use  |

| L5 verb         | Definition   | Example  |
|-----------------|--|--|
| <b>Theorise</b> | Extract general principles from a particular experience                    | Theorise the resolution of conflict between a slow and a fast aircraft |
| <b>Validate</b> | Make valid, ratify, prove valid, show or confirm the validity of something | Validate one radar vectoring option to expedite the traffic            |

g. Application of taxonomy levels to practically-based objectives

- i. Objectives at taxonomy level 3 or higher, which are of a practical nature, related to all subjects except ATM, may be achieved by any suitable type of practical training methods e.g. hands on, plotting on charts, etc.
- ii. Objectives at taxonomy level 3 or higher, for the ATM subject (Basic and Rating), are practical by nature and require the integration of several knowledge areas and skills at the same time, e.g. vectoring of an aircraft requires knowledge and skills in the areas of radio telephony, aircraft performance, navigation and radar theory. Therefore, ATM level 3 objectives should be achieved through the use of a part task trainer or a simulator.
- iii. ATM level 4 objectives should be achieved for the most part through the use of a simulator. A part task trainer, which presents operational situations at an enforced pace, may be used to achieve some ATM level 4 objectives.
- iv. ATM level 5 objectives should be achieved through the use of a simulator.

-----

## Supplement 2

### Abbreviations

For the purposes of these AMCs, the following abbreviations and acronyms shall apply:

| Abbreviation | Meaning  |
|--------------|--|
| ABAS         | Aircraft-based Augmentation System (EGNOS)   |
| ACAS         | Airborne Collision Avoidance System  |
| ACC          | Area Control Centre  |
| ACP          | Area Control Procedural Rating   |
| ACFT         | Aircraft (subject)   |
| ACN          | Aircraft Classification Number   |
| ACS          | Area Control Surveillance Rating   |
| ADF          | Automatic Direction Finding System   |
| ADI          | Aerodrome Control Instrument   |
| ADS          | Automatic Dependent Surveillance   |
| ADV          | Aerodrome Control Visual Rating  |
| ADVS         | Advisory Service   |
| AEA          | Association of European Airlines   |
| AFIL         | Air Filed Flight Plan  |
| AFTN         | Aeronautical fixed telecommunication network   |
| AGA          | Aerodromes   |
| AIC          | Aeronautical Information Circular  |
| AIP          | Aeronautical Information Publication   |
| AIRAC        | Aeronautical Information Regulation and Control  |
| AIRAC SUP    | AIRAC Supplement   |
| AIREP        | Air-Report   |
| AIRMET       | Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations |
| AIS          | Aeronautical Information Service   |
| ALRS         | Alerting Service   |
| AMC          | Acceptable Means of Compliance   |
| APM          | Approach Path Monitor  |
| APP          | Approach Control / Centre / Procedural Rating  |
| APS          | Approach Control Surveillance Rating   |
| APV          | Approach Procedure with Vertical guidance  |
| APW          | Area Proximity Warning   |
| ASDA         | Accelerate Stop Distance Available   |

|         |  |
|---------|--|
| ASM     | Airspace Management  |
| ASMGCS  | Advanced Surface Movement Guidance and Control Systems               |
| ATC     | Air Traffic Control  |
| ATCEUC  | Air Traffic Controllers European Unions Co-ordination                |
| ATCO    | Air Traffic Controller   |
| ATCS    | Air Traffic Control Service  |
| ATFCM   | Air Traffic Flow and Capacity Management                             |
| ATFM    | Air Traffic Flow Management  |
| ATIS    | Automatic Terminal Information Service                               |
| ATM     | Air Traffic Management   |
| ATS     | Air Traffic Services   |
| ATZ     | Aerodrome Traffic Zone   |
| AVASI   | Advanced Visual Approach Slope Indicator                             |
| B-RNAV  | Basic Area Navigation  |
| BIRDTAM | Bird hazard NOTAM (NOTAM reporting bird hazard)                      |
| CANSO   | Civil Air Navigation Services Organisation                           |
| CAT     | Clear Air Turbulence   |
| CBA     | Cross Border Area  |
| CBT     | Computer Based Training  |
| CCIS    | Closed Circuit Information System                                    |
| CDR     | Conditional Route  |
| CISM    | Critical Incident Stress Management                                  |
| CPDLC   | Controller Pilot Data Link Communications                            |
| CPL     | Current Flight Plan  |
| D-GPS   | Differential Global Positioning System                               |
| DFTI    | Distance from Touchdown Indicator                                    |
| DME     | Distance Measuring Equipment   |
| Doc     | Document   |
| EAM     | ESARR Advisory Material  |
| EASA    | European Aviation Safety Agency                                      |
| EAT     | Expected Approach Time   |
| EATCHIP | European Air Traffic Control Harmonisation and Integration Programme |
| EATMP   | European Air Traffic Management Programme                            |
| EC      | European Commission  |
| ECAC    | European Civil Aviation Conference                                   |
| EET     | Estimated Elapsed Time   |
| EFIS    | Electronic Flight Instrument System                                  |

|             |  |
|-------------|--|
| EGNOS       | European Geostationary Overlay Service                           |
| EQPS        | Equipment and Systems (subject)                                  |
| ESARR       | Eurocontrol Safety Regulatory Requirements                       |
| ETF         | European Transport Workers' Federation                           |
| EUROCONTROL | European Organisation for the Safety of Air Navigation           |
| FAB         | Functional Airspace Block  |
| FDPS        | Flight Data Processing System                                    |
| FIR         | Flight Information Region  |
| FIS         | Flight Information Service                                       |
| FMS         | Flight Management System   |
| FPB         | Flight Progress Board  |
| FPL         | Flight Plan  |
| FUA         | Flexible Use of Airspace   |
| GAIN Report | Global Aviation Information Network Report                       |
| GBAS        | Ground Based Augmentation System                                 |
| GLONASS     | Global Orbiting Navigation Satellite System                      |
| GNSS        | Global Navigation Satellite System                               |
| GP          | Glide Path   |
| GPS         | Global Positioning System  |
| GPWS        | Ground Proximity Warning System                                  |
| GUI         | Guidelines   |
| HBK         | Handbook   |
| HF          | High Frequency   |
| HUM         | Human Factors (subject)  |
| IACA        | International Air Carrier Association                            |
| IAOPA       | International Council of Aircraft Owner and Pilot Associations   |
| IATA        | International Air Transport Association                          |
| ICAO        | International Civil Aviation Organisation                        |
| IFALPA      | International Federation of Airline Pilots Association           |
| IFATCA      | International Federation of Air Traffic Controllers Associations |
| IFPS        | Integrated Initial Flight Plan Processing System                 |
| IFR         | Instrument Flight Rules  |
| ILS         | Instrument Landing System  |
| IMC         | Instrument Meteorological Conditions                             |
| INS         | Inertial Navigation System                                       |
| INTR        | Introduction to the course (subject)                             |
| IRS         | Inertial Reference System  |
| IRVR        | Instrument Runway Visual Range                                   |

|        |   |
|--------|---|
| ISA    | International Standard Atmosphere                 |
| ITU    | International Telecommunications Union            |
| LAW    | Aviation Law (subject)                            |
| LDA    | Landing Distance Available                        |
| LLZ    | Localizer   |
| LNAV   | Lateral Navigation                                |
| LOA    | Letter of Agreement                               |
| LPV    | Lateral Precision with Vertical guidance approach |
| MET    | Meteorology                                       |
| METAR  | Meteorological Aviation Routine Weather Report    |
| MLS    | Microwave Landing System                          |
| Mode A | SSR identification code                           |
| Mode C | SSR Mode C (Pronounced: Mode Charlie)             |
| Mode S | Mode Select                                       |
| MONA   | Monitoring Aids                                   |
| MSAW   | Minimum Safe Altitude Warning                     |
| MTCD   | Medium Term Conflict Detection                    |
| MWO    | Meteorological Watch Office                       |
| NAV    | Navigation (subject)                              |
| NAVAID | Navigation(al) Aid                                |
| NDB    | Non-Directional Beacon                            |
| No.    | Number  |
| NOTAM  | Notice to Airmen                                  |
| OJT    | On the Job Training                               |
| OLDI   | On-Line Data Interchange                          |
| P-RNAV | Precision Area Navigation                         |
| PANS   | Procedures for Air Navigation Services            |
| PAPI   | Precision Approach Path Indicator                 |
| PAR    | Precision Approach Radar                          |
| PBN    | Performance Based Navigation                      |
| PCN    | Pavement Classification Number                    |
| PEN    | Professional Environment (subject)                |
| PSR    | Primary Surveillance Radar                        |
| PTP    | Part Time Practice                                |
| QDM    | Magnetic Heading                                  |
| QDR    | Magnetic Bearing                                  |
| QFE    | Atmospheric pressure at aerodrome elevation       |
| QNH    | Atmospheric pressure at mean sea level            |



|               |   |
|---------------|---|
| QTF           | The position of the transmitting station according to the bearings taken by the D/F station |
| RAIM          | Receiver Autonomous Integrity Monitoring  |
| RCC           | Rescue Coordination Centre  |
| RDPS          | Radar Data Processing System  |
| RNAV          | Area Navigation   |
| RNP           | Required Navigation Performance   |
| RNP-RNAV      | Required Navigation Performance-Area Navigation   |
| ROC           | Rate of Climb   |
| RPL           | Stored Flight Plan  |
| RTF           | Radio Telephony   |
| RVR           | Runway Visual Range   |
| RVSM          | Reduced Vertical Separation Minimum   |
| SADIS         | Satellite Distribution of World Area Forecast System  |
| SAR           | Search and Rescue   |
| SARPs         | Standards and Recommended Practices (ICAO)  |
| SBAS          | Satellite Based Augmentation System   |
| SELCAL        | Selective Calling   |
| SERA          | Standardised European Rules of the Air  |
| SHELL (model) | Software, Hardware, Environment, Live ware, Live ware Model                                 |
| SID           | Standard Instrument Departure (Route)   |
| SIGMET        | Significant Meteorological Information  |
| SMR           | Surface Movement Radar  |
| SNOWTAM       | NOTAM on SNOW conditions  |
| SPECI         | Aviation Selected Special Weather Report  |
| SRC           | Safety Regulation Commission  |
| SRU           | Safety Regulation Unit  |
| SSR           | Secondary Surveillance Radar  |
| STCA          | Short Term Conflict Alert   |
| SVFR          | Special Visual Flight Rules Flight  |
| TACAN         | UHF Tactical Air Navigation Aid   |
| TAF           | Terminal Area (Aerodrome) Forecast  |
| TCAC          | Tropical Cyclone Advisory Centre  |
| TODA          | Take Off Distance Available   |
| TORA          | Take Off Run Available  |
| TRM           | Team Resource Management  |
| TSA           | Temporary Segregated Area   |
| TWR           | Tower Control Unit (Aerodrome Control Tower)  |

|        |  |
|--------|--|
| UDES   | Unusual Degraded Emergency Situations    |
| UDF    | Ultra High Frequency Direction Finder    |
| UHF    | Ultra High Frequency                     |
| UTC    | Coordinated Universal Time               |
| VAAC   | Volcanic Ash Advisory Centre             |
| VASI   | Visual Approach Slope Indicator          |
| VDF    | Very High Frequency Direction Finder     |
| VFR    | Visual Flight Rules                      |
| VHF    | Very High Frequency                      |
| VMC    | Visual Meteorological Conditions         |
| VNAV   | Vertical Navigation                      |
| VOLMET | Routine Weather Reports Broadcast on VHF |
| VOR    | VHF Omni-directional Radio Range         |
| WAFC   | World Area Forecast Centre               |
| WAFS   | World Area Forecast System               |
| WGS-84 | World Geodetic System 84                 |

**ANNEX 1 - PART-ATCO**  
**SUBPART D - ATCO TRAINING**  
**Section 2 - Initial training requirements for Air Traffic Controllers**

**AMC1 to Appendix 5**  
**Aerodrome Control Instrument Rating for Tower ADI (TWR)**

- A. General principles that apply to this AMC are contained in ~~the~~ ~~its~~ ~~enclosed~~ Supplement ~~1 to AMC1~~.
- B. ATCO Rating training Aerodrome Control Instrument Rating for Tower ADI (TWR) should contain the following ~~subject objectives and~~ training objectives that are associated with the subjects, ~~subject objectives,~~ topics and subtopics contained in **Appendix 5 - Aerodrome Control Instrument Rating for Tower ADI (TWR)**
- C. Subjects, ~~subject objectives,~~ topics and subtopics from ~~the~~ Appendix 5 are repeated in this AMC for the convenience of the reader and do not form a part of it.

## NPA -> CRD TRACK CHANGES FILE

This document has been provided to help reviewers make a comparison between the corresponding AMCs to appendices of the NPA 2012-18 (15 Nov 2012) and the CRD (30 Sep 2013) of Licensing and medical certification of air traffic controllers Implementing Rule - Part (B.V) ATCO Initial training requirements.

To decode the changes the following conventions have been used:

**Deleted** information is shown with the ~~strikethrough-effect~~

**Relocated** information is shown with the ~~strikethrough-effect~~

**New** information is shown in ~~blue text~~.

When an existing objective has been relocated (and consequently renumbered) the new number is shown in black to the left of the objective and the original number in red below the new one.

3.2.1 - current objective number (if not modified it is the same as in NPA 2012-18 (B.V)

3.3.3 - old objective number that may have an additional subject indication if moved from one subject to another or B(asic) and R(ating) if moved from one syllabus to another

1.5.3 - new objective number for relocated objectives at its original location that may have an additional indication of a new subject or B(asic) and R(ating) if moved from one syllabus to another

## TABLE OF CONTENTS

|  |    |
|--|----|
| SUBJECT 1: INTRODUCTION TO THE COURSE-----   | 3  |
| SUBJECT 2: AVIATION LAW-----   | 5  |
| SUBJECT 3: AIR TRAFFIC MANAGEMENT-----   | 7  |
| SUBJECT 4: METEOROLOGY-----  | 16 |
| SUBJECT 5: NAVIGATION-----   | 18 |
| SUBJECT 6: AIRCRAFT-----   | 20 |
| SUBJECT 7: HUMAN FACTORS-----  | 22 |
| SUBJECT 8: EQUIPMENT AND SYSTEMS-----  | 27 |
| SUBJECT 9: PROFESSIONAL ENVIRONMENT-----   | 30 |
| SUBJECT 10: <del>UNUSUAL/DEGRADED</del> ABNORMAL AND EMERGENCY<br>SITUATIONS ----- | 32 |
| SUBJECT 11: AERODROMES -----   | 35 |
| Supplements -----  | 38 |

## Subject 1 : INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

### TOPIC INTR 1 COURSE MANAGEMENT

| Subtopic                | INTR 1.1 Course introduction  |   |  |     |
|-------------------------|---|---|--|-----|
| ADI (TWR)<br>INTR 1.1.1 | Explain the aims and main objectives of the course.                 | 2 |  | ALL |
| Subtopic                | INTR 1.2 Course administration                                      |   |  |     |
| ADI (TWR)<br>INTR 1.2.1 | State course administration.  | 1 |  | ALL |
| Subtopic                | INTR 1.3 Study material and training documentation                  |   |  |     |
| ADI (TWR)<br>INTR 1.3.1 | Use appropriate documentation and their sources for course studies. | 3 | Optional content: Training documentation, library, CBT library, Web, Learning Management Server        | ALL |
| ADI (TWR)<br>INTR 1.3.2 | Integrate appropriate information into course studies.              | 4 | Training documentation<br>Optional content: Training documentation, supplementary information, library | ALL |

### TOPIC INTR 2 INTRODUCTION TO THE ATC TRAINING COURSE

| Subtopic                | INTR 2.1 Course content and organisation                    |   |  |     |
|-------------------------|---|---|--|-----|
| ADI (TWR)<br>INTR 2.1.1 | State the different training methods applied in the course. | 1 | Theoretical training, practical training, self-study, types of training events                                   | ALL |
| ADI (TWR)<br>INTR 2.1.2 | State the subjects of the course and their purpose.         | 1 |  | ALL |
| ADI (TWR)<br>INTR 2.1.3 | Describe the organisation of theoretical training.          | 2 | Optional content: course programme   | ALL |
| ADI (TWR)<br>INTR 2.1.4 | Describe the organisation of practical training.            | 2 | Optional content: PTP, Simulation, Briefing, Debriefing, course programme  | ALL |
| Subtopic                | INTR 2.2 Training ethos                                     |   |  |     |
| ADI (TWR)<br>INTR 2.2.1 | Recognise the feedback mechanisms available.                | 1 | Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback | ALL |
| Subtopic                | INTR 2.3 Assessment process                                 |   |  |     |

---

|                         |                                  |
|-------------------------|----------------------------------|
| ADI (TWR)<br>INTR 2.3.1 | Describe the assessment process. |
|-------------------------|----------------------------------|

---

2

ALL

## Subject 2 : AVIATION LAW

The subject objective is:

Learners shall ~~not~~ know, understand and apply the Rules of the Air and the Regulations regarding reporting, airspace and ~~not~~ appreciate the Licensing and Competence principles.

### TOPIC LAW 1 ATCO LICENSING / CERTIFICATE OF COMPETENCE

| Subtopic                            | LAW 1.1 Privileges and conditions   |   |  |     |
|-------------------------------------|---|---|--|-----|
| ADI (TWR)<br>LAW 1.1.1              | Appreciate the conditions which <del>must</del> shall be met <del>to for the</del> issue <del>an of</del> Aerodrome Control Instrument rating with Tower Control endorsement. | 3 | Commission Regulation (EU) on ATCO Licensing No xxx/yyyy <del>805/2011</del> | ADI |
|                                     |   |   | Optional content: National document  |     |
| ADI (TWR)<br>LAW 1.1.2<br>6.1.1 HUM | Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.   | 2 |  | ALL |
| ADI (TWR)<br>LAW 1.1.3<br>1.1.2     | Explain the conditions for suspension/revocation of ATCO licence.   | 2 | Commission Regulation (EU) on ATCO Licensing No xxx/yyyy <del>805/2011</del> | ALL |

### TOPIC LAW 2 RULES AND REGULATIONS

| Subtopic               | LAW 2.1 Reports  |   |   |     |
|------------------------|--|---|---|-----|
| ADI (TWR)<br>LAW 2.1.1 | List the standard forms for reports.   | 1 | Air traffic incident report   | ALL |
|                        |  |   | Optional content: routine air reports, breach of regulations, watch/log book, records   |     |
| ADI (TWR)<br>LAW 2.1.2 | Describe the functions of, and processes for, reporting.   | 2 | Reporting culture, Air traffic incident report  | ALL |
|                        |  |   | Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2  |     |
| ADI (TWR)<br>LAW 2.1.3 | Use forms for reporting.   | 3 | Air traffic incident reporting form(s)  | ALL |
|                        |  |   | Optional content: ICAO Doc 4444 Appendix 4, routine air reports, breach of regulations, watch/log book, records   |     |
| Subtopic               | LAW 2.2 Airspace   |   |   |     |
| ADI (TWR)<br>LAW 2.2.1 | Appreciate classes and structure of airspace and their relevance to Aerodrome Control Instrument rating with Tower Control endorsement operations. | 3 |   | ADI |
| ADI (TWR)<br>LAW 2.2.2 | Provide planning, coordination and control actions appropriate to the airspace classification and structure.                                       | 4 | Optional content: ICAO Annex 2, ICAO Annex 11, International requirements, Civil requirements, Military requirements, Areas of responsibility, Sectorisation, National requirements | ALL |

|   |  |   |  |     |
|---|--|---|--|-----|
| ADI (TWR)<br>LAW 2.2.3                              | Appreciate responsibility for terrain clearance.   | 3 |  | ALL |
| <b>TOPIC LAW 3 ATC SAFETY MANAGEMENT</b>            |  |   |  |     |
| <b>Subtopic LAW 3.1 Experience-Feedback process</b> |  |   |  |     |
| ADI (TWR)<br>LAW 3.1.1<br>10.1.1 HUM                | State the importance of <del>the</del> controllers contribution to the <del>experience</del> feedback process. | 1 | Optional content: voluntary reporting  | ALL |
| ADI (TWR)<br>LAW 3.1.2<br>10.1.2 HUM                | Describe how reported occurrences are analysed.  | 2 | Optional content: ESARR 2, local procedures  | ALL |
| ADI (TWR)<br>LAW 3.1.3<br>10.1.3 HUM                | Name the means used to disseminate recommendations.  | 1 | Optional content: Safety letters, safety boards web pages                          | ALL |
| ADI (TWR)<br>LAW 3.1.4<br>10.1.4 HUM                | <del>Appreciate</del> <del>Explain</del> the 'Just Culture' concept.   | 3 | Benefits, prerequisites, constraints<br>Optional content: EAM 2 GUI 6, GAIN Report | ALL |
| <b>Subtopic LAW 3.2 Safety Investigation-Branch</b> |  |   |  |     |
| ADI (TWR)<br>LAW 3.2.1<br>10.2.1 HUM                | Describe role and mission of Safety Investigation <del>Branch</del> in the improvement of safety.              | 2 |  | ALL |
| ADI (TWR)<br>LAW 3.2.2<br>10.2.2 HUM                | Define working methods of Safety Investigation <del>Branch</del> .   | 1 |  | ALL |



### Subject 3 : AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

| TOPIC                             | ATM 1  | PROVISION OF SERVICES                               | <del>AIR TRAFFIC SERVICES AND AIRSPACE MANAGEMENT</del>  |
|-----------------------------------|--|---|--|
| Subtopic                          | ATM 1.1  | Aerodrome control service                           |  |
| ADI (TWR)<br>ATM 1.1.1<br>1.1.2   | Appreciate areas of responsibility.  | 3   | Control Zone, Traffic Circuit, Manoeuvring Area, Movement Area, Vicinity<br><i>Optional content: ATZ</i>   |
| ADI (TWR)<br>ATM <del>1.1.1</del> | <del>Describe specific areas of responsibility of aerodrome control.</del>                                 | 2   | <del>ICAO Annex 11</del>   |
| ADI (TWR)<br>ATM 1.1.2<br>1.1.3   | Provide <del>the appropriate</del> aerodrome control service.  | 4   | ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals   |
| Subtopic                          | ATM 1.2  | Flight information service (FIS)                    |  |
| ADI (TWR)<br>ATM 1.2.1            | Describe the information that shall be passed to aircraft by an aerodrome controller.                      | 2   | ICAO Annex 11  |
| ADI (TWR)<br>ATM 1.2.2            | Provide FIS.   | 4   | ICAO Doc 4444<br><i>Optional content: national documents</i>   |
| ADI (TWR)<br>ATM 1.2.3            | Issue appropriate <del>traffic</del> information.  | 3   | ICAO Doc 4444, <i>essential local traffic, traffic information</i>   |
| ADI (TWR)<br>ATM 1.2.4            | <i>Appreciate the use of ATIS for the provision of flight information service by aerodrome controller.</i> | 3   |  |
| Subtopic                          | ATM 1.3  | Alerting service (ALRS)                             |  |
| ADI (TWR)<br>ATM 1.3.1            | Provide ALRS.  | 4   | ICAO Doc 4444<br><i>Optional content: national documents</i>   |
| ADI (TWR)<br>ATM 1.3.2            | Respond to distress and urgency messages and signals.  | 3   | ICAO Annex 10, ICAO Doc 4444,<br><i>Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations</i> |
| Subtopic                          | ATM 1.4  | ATS System capacity and air traffic flow management |  |

|                        |   |   |   |            |
|------------------------|---|---|---|------------|
| ADI (TWR)<br>ATM 1.4.1 | Appreciate principles of <del>ATFCM</del> <b>ATS</b> system capacity and air traffic flow management. | 3 | Optional content: <b>EUROCONTROL ATFCM Users Manual</b> <del>Working principles of ATFCM, CFMU, Slot management, Slot allocation procedures</del>   | ADV<br>ADI |
| ADI (TWR)<br>ATM 1.4.2 | Organise traffic to take account of flow management.  | 4 | Optional content: departure sequence  | ADV<br>ADI |
| ADI (TWR)<br>ATM 1.4.3 | Inform appropriate authority.   | 3 | Optional content: abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, unusual meteorological conditions, relevant information: reported ground-based incidents, forest fire, smoke, oil pollution | ADV<br>ADI |

## TOPIC ATM 2 COMMUNICATION

| Subtopic                                       | ATM 2.1 Effective communication  |   |  |     |
|--|--|---|--|-----|
| ADI (TWR)<br>ATM 2.1.1                         | Use approved phraseology.  | 3 | ICAO Doc 4444<br><br>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2 | ALL |
| ADI (TWR)<br>ATM 2.1.2                         | <del>Ensure effective</del> <b>Perform</b> communication. <del>effectively.</del>    | 4 | Communication techniques, Readback/verification of readback  | ALL |
| ADI (TWR)<br>ATM <del>2.1.3</del><br>6.1.2 HUM | <del>Analyse examples of pilot and controller communication for effectiveness.</del> | 4 |  | ALL |

## TOPIC ATM 3 ATC CLEARANCES AND ATC INSTRUCTIONS

| Subtopic               | ATM 3.1 ATC clearances                                   |   |   |     |
|------------------------|--|---|---|-----|
| ADI (TWR)<br>ATM 3.1.1 | Issue appropriate ATC clearances.                        | 3 | ICAO Doc 4444<br><br>Optional content: national documents | ALL |
| ADI (TWR)<br>ATM 3.1.2 | Integrate appropriate ATC clearances in control service. | 4 |   | ALL |
| ADI (TWR)<br>ATM 3.1.3 | Ensure the agreed course of action is carried out.       | 4 |   | ALL |
| Subtopic               | ATM 3.2 ATC instructions                                 |   |   |     |
| ADI (TWR)<br>ATM 3.2.1 | Issue appropriate ATC instructions.                      | 3 | ICAO Doc 4444<br><br>Optional content: national documents | ALL |

|                        |  |   |     |
|------------------------|--|---|-----|
| ADI (TWR)<br>ATM 3.2.2 | Integrate appropriate ATC instructions in control service. | 4 | ALL |
| ADI (TWR)<br>ATM 3.2.3 | Ensure the agreed course of action is carried out.         | 4 | ALL |

## TOPIC ATM 4 COORDINATION

### Subtopic ATM 4.1 Necessity for coordination

|                        |                                     |   |     |
|------------------------|-------------------------------------|---|-----|
| ADI (TWR)<br>ATM 4.1.1 | Identify the need for coordination. | 3 | ALL |
|------------------------|-------------------------------------|---|-----|

### Subtopic ATM 4.2 Tools and methods for coordination

|                        |   |   |   |     |
|------------------------|---|---|---|-----|
| ADI (TWR)<br>ATM 4.2.1 | Use the available tools for coordination. | 3 | Optional content: Electronic transfer of flight data, Telephone, Interphone, Intercom, Direct speech, Radiotelephone (RTF), Local agreements, automated system coordination | ALL |
|------------------------|---|---|---|-----|

### Subtopic ATM 4.3 Coordination procedures

|                        |  |   |  |     |
|------------------------|--|---|--|-----|
| ADI (TWR)<br>ATM 4.3.1 | Initiate appropriate coordination.                                     | 3 | Delegation/transfer of responsibility for air-ground communications and separation, transfer of control, etc. ICAO Doc 4444<br><br>Optional content: release point | ALL |
| ADI (TWR)<br>ATM 4.3.2 | Analyse effect of coordination requested by an adjacent position/unit. | 4 | Optional content: Delegation/transfer of responsibility for air-ground communications and separation, release point, transfer of control, etc.                     | ALL |
| ADI (TWR)<br>ATM 4.3.3 | Select, after negotiation, an appropriate course of action.            | 5 | <del>When additional traffic cannot be accepted by adjacent position/unit, When additional traffic cannot be accepted by own position/unit, etc.</del>             | ALL |
| ADI (TWR)<br>ATM 4.3.4 | Ensure the agreed course of action is carried out.                     | 4 |  | ALL |
| ADI (TWR)<br>ATM 4.3.5 | Coordinate in the provision of FIS.                                    | 4 | ICAO Doc 4444  | ALL |
| ADI (TWR)<br>ATM 4.3.6 | Coordinate in the provision of ALRS.                                   | 4 | ICAO Doc 4444  | ALL |

## TOPIC ATM 5 ALTIMETRY AND LEVEL ALLOCATION

### Subtopic ATM 5.1 Altimetry

|   |  |   |  |            |
|---|--|---|--|------------|
| ADI (TWR)<br>ATM 5.1.1  | Allocate levels ( <del>height, altitude, flight level</del> ) according to altimetry data.                                 | 4 | ICAO Doc 8168, ICAO Doc 4444   | ALL        |
| ADI (TWR)<br>ATM 5.1.2  | Ensure separation according to altimetry data.   | 4 | <i>Optional content: Transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries</i> | ALL        |
| <b>Subtopic ATM 5.2 Terrain clearance</b>   |  |   |  |            |
| ADI (TWR)<br>ATM 5.2.1  | Provide planning, coordination and control actions appropriate to the rules for minimum safe height and terrain clearance. | 4 | <i>Optional content: Terrain clearance dimensions, Minimum safe altitudes, Transition level, Minimum flight level, Minimum sector altitude</i>             | ADI        |
| <b>TOPIC ATM 6 SEPARATIONS</b>  |  |   |  |            |
| <b>Subtopic ATM 6.1 Separation between departing aircraft</b>                             |  |   |  |            |
| ADI (TWR)<br>ATM 6.1.1  | Provide separation between departing aircraft.   | 4 | ICAO Doc 4444  | ADV<br>ADI |
| <b>Subtopic ATM 6.2 Separation of departing aircraft from arriving aircraft</b>           |  |   |  |            |
| ADI (TWR)<br>ATM 6.2.1  | Provide separation of departing aircraft from arriving aircraft.   | 4 | ICAO Doc 4444  | ADI        |
| <b>Subtopic ATM 6.3 Separation of landing aircraft and preceding landing or departing</b> |  |   |  |            |
| ADI (TWR)<br>ATM 6.3.1  | Provide separation of landing aircraft and preceding landing or departing aircraft.  | 4 | ICAO Doc 4444  | ADV<br>ADI |
| <b>Subtopic ATM 6.4 Time-based wake turbulence longitudinal separation</b>                |  |   |  |            |
| ADI (TWR)<br>ATM 6.4.1  | Provide time-based wake turbulence longitudinal separation.  | 4 | ICAO Doc 4444  | ADI        |
| <b>Subtopic ATM 6.5 Reduced separation minima</b>   |  |   |  |            |
| ADI (TWR)<br>ATM 6.5.1  | Provide reduced separation minima.   | 4 | ICAO Doc 4444  | ADI        |
| <b>TOPIC ATM 7 AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS</b>      |  |   |  |            |
| <b>Subtopic ATM 7.1 Airborne collision avoidance systems</b>                              |  |   |  |            |
| ADI (TWR)<br>ATM 7.1.1<br>7.1.6 B   | Differentiate between ACAS advisory thresholds and <del>ATC</del> aerodrome separation standards.                          | 2 | ICAO Doc 9863  | ADV<br>ADI |
| ADI (TWR)<br>ATM 7.1.2<br>7.1.4 B   | Describe the controller responsibility during and following an ACAS RA reported by pilot.                                  | 2 | ICAO Doc 4444  | ALL        |

|  |  |   |   |            |
|--|--|---|---|------------|
| ADI (TWR)<br>ATM 7.1.3<br>7.1.1  | Respond to pilot notification of actions based on airborne systems warnings. | 3 | ACAS, <del>GPWS-TAWS</del><br><i>Optional content: EUROCONTROL ACAS Web page</i>  | ADV<br>ADI |
| <b>Subtopic ATM 7.2 Ground-based safety nets</b>                               |  |   |   |            |
| ADI (TWR)<br>ATM 7.2.1   | Respond to available ground-based safety nets warnings.                      | 3 | <i>Optional content: Anti-incursion</i>   | ADV<br>ADI |
| <b>TOPIC ATM 8 DATA DISPLAY</b>  |  |   |   |            |
| <b>Subtopic ATM 8.1 Data management</b>  |  |   |   |            |
| ADI (TWR)<br>ATM 8.1.1   | Update the data display to accurately reflect the traffic situation.         | 3 | <i>Optional content: Information displayed, strip marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs</i> | ALL        |
| ADI (TWR)<br>ATM 8.1.2   | Analyse pertinent data on data displays.                                     | 4 |   | ALL        |
| ADI (TWR)<br>ATM 8.1.3   | Organise pertinent data on data displays.                                    | 4 |   | ALL        |
| ADI (TWR)<br>ATM <del>8.1.4</del>  | <del>Process pertinent data on data displays.</del>                          | 3 |   | ALL        |
| ADI (TWR)<br>ATM 8.1.4<br>8.1.5  | Obtain flight plan information.  | 3 | CPL, FPL, Supplementary information<br><i>Optional content: RPL, AFIL, etc.</i>   | ALL        |
| ADI (TWR)<br>ATM 8.1.5<br>8.1.6  | Use flight plan information.   | 3 |   | ALL        |
| <b>TOPIC ATM 9 OPERATIONAL ENVIRONMENT (SIMULATED)</b>                         |  |   |   |            |
| <b>Subtopic ATM 9.1 Integrity of the operational environment</b>               |  |   |   |            |
| ADI (TWR)<br>ATM 9.1.1   | Obtain information concerning the operational environment.                   | 3 | <i>Optional content: Briefing, notices, local orders, verification of information</i>   | ALL        |
| ADI (TWR)<br>ATM 9.1.2   | Ensure the integrity of the operational environment.                         | 4 | <i>Optional content: Frequency, VOLMET, ATIS, SIGMET, Systems set-up, Integrity of displays</i>   | ADV<br>ADI |
| <b>Subtopic ATM 9.2 Verification of the currency of operational procedures</b> |  |   |   |            |
| ADI (TWR)<br>ATM 9.2.1   | Check all relevant documentation before managing traffic.                    | 3 | <i>Optional content: Briefing, LOAs, NOTAM, AICs</i>  | ALL        |
| <b>Subtopic ATM 9.3 Handover-takeover</b>                                      |  |   |   |            |

|   |   |   |   |            |
|---|---|---|---|------------|
| ADI (TWR)<br>ATM 9.3.1  | Transfer information to the relieving controller.                                       | 3 |   | ALL        |
| ADI (TWR)<br>ATM 9.3.2  | Obtain information from the controller handing over.                                    | 3 |   | ALL        |
| <b>TOPIC ATM 10 PROVISION OF AN AERODROME CONTROL SERVICE</b> |   |   |   |            |
| <b>Subtopic ATM 10. Responsibility for the provision</b>      |   |   |   |            |
| ADI (TWR)<br>ATM 10.1.1                                       | Explain the responsibility for the provision of an aerodrome control service.           | 2 | ICAO Doc 4444, ICAO Annex 11  | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.1.2                                       | Describe the division of responsibility between air traffic control units.              | 2 | ICAO Doc 4444   | ALL        |
| ADI (TWR)<br>ATM 10.1.3                                       | Describe the responsibility in regard to military traffic.                              | 2 | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9554</i>                           | ALL        |
| ADI (TWR)<br>ATM 10.1.4                                       | Describe the responsibility in regard to unmanned free balloons.                        | 2 | ICAO Doc 4444   | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.1.5<br>3.5.1 ACFT                         | Appreciate the influence of operational requirements.                                   | 3 | <i>Optional content: Military flying, Calibration flights, Aerial photography</i> | ALL        |
| <b>Subtopic ATM 10. Functions of aerodrome control tower</b>  |   |   |   |            |
| ADI (TWR)<br>ATM 10.2.1                                       | Manage the general functions of aerodrome control.                                      | 4 | ICAO Doc 4444   | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.2.2                                       | Manage the suspension of VFR operations.  | 4 | ICAO Doc 4444   | ADV<br>ADI |
| <b>Subtopic ATM 10. Traffic management process</b>            |   |   |   |            |
| ADI (TWR)<br>ATM 10.3.1                                       | Ensure that situational awareness is maintained.  | 4 | Information gathering, observation, traffic projection                            | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.3.2                                       | Detect conflicts in time for appropriate resolution.                                    | 4 |   | ALL        |
| ADI (TWR)<br>ATM 10.3.3                                       | Identify potential solutions to achieve a safe and effective flow of aerodrome traffic. | 3 |   | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.3.4                                       | Evaluate possible outcomes of different control actions.                                | 5 |   | ADV<br>ADI |

|  |   |   |  |            |
|--|---|---|--|------------|
| ADI (TWR)<br>ATM 10.3.5  | Select an appropriate plan in time to achieve safe and effective flow of aerodrome traffic. | 5 |  | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.3.6<br>10.5.4  | Ensure an adequate priority of actions.   | 4 | Formal and situational requirements;<br>Workload   | ALL        |
| ADI (TWR)<br>ATM 10.3.7  | Execute plan in a timely manner.  | 3 |  | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.3.8  | Ensure a safe and efficient outcome is achieved.  | 4 | Traffic monitoring, adaptability and follow up   | ALL        |
| <b>Subtopic ATM 10. Aeronautical ground lights</b>                         |   |   |  |            |
| ADI (TWR)<br>ATM 10.4.1<br>10.3.1  | Select appropriate aeronautical ground lights.  | 5 | ICAO Doc 4444  | ADV<br>ADI |
| <b>Subtopic ATM 10. Information to aircraft by aerodrome control tower</b> |   |   |  |            |
| ADI (TWR)<br>ATM 10.5.1<br>10.4.1  | Provide information related to the operation of aircraft.                                   | 4 | ICAO Doc 4444  | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.5.2<br>10.4.2  | Provide information on aerodrome conditions.  | 4 | ICAO Doc 4444  | ADV<br>ADI |
| <b>Subtopic ATM 10. Control of aerodrome traffic</b>                       |   |   |  |            |
| ADI (TWR)<br>ATM 10.6.1<br>10.5.1  | Predict positions of aircraft in the aerodrome traffic and taxi circuits.                   | 4 | ICAO Doc 4444  | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.6.2<br>10.5.2  | Manage traffic on the manoeuvring area.   | 4 | ICAO Doc 4444<br>Aircraft, vehicles<br><i>Optional content: runway inspection</i>                | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.6.3<br>10.5.3  | Manage traffic in accordance with procedural changes.                                       | 4 | <i>Optional content: Taxiway closure</i>   | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.6.4  | Balance the workload against personal capacity.   | 5 | <i>Optional content: re-planning, prioritising solutions, denying requests, delaying traffic</i> | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.5.4<br>10.3.6  | Ensure an adequate priority of actions.   | 4 | Formal and situational requirements;<br>Workload   | ADV<br>ADI |

| Subtopic ATM 10. Control of traffic in the traffic circuit |   |   |   |            |
|--|---|---|---|------------|
| ADI (TWR)<br>ATM 10.7.1<br>10.6.1                          | Manage traffic in the traffic circuit.  | 4 | ICAO Doc 4444<br>Meteorological phenomena,<br>Geographical knowledge,<br>Environmental factors                                | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.7.2<br>10.6.2                          | Manage arriving and departing traffic.  | 4 | ICAO Doc 4444, Allocation of the<br>order of priority, Meteorological<br>phenomena, Wake turbulence,<br>Environmental factors | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.7.3<br>10.6.3                          | Integrate the serviceability of radio aids in<br>the management of aerodrome traffic.             | 4 | <i>Optional content: UDF, VDF, MLS, ILS,<br/>NDB, VOR, DME</i>  | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.7.4<br>10.6.4                          | Integrate surface conditions into the<br>control of aerodrome traffic.                            | 4 | <i>Optional content: Damp, Wet, Water<br/>patches, Flooding, Snow, Slush, Ice,<br/>Braking action</i>                         | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.7.5<br>10.6.5                          | Integrate information about<br>meteorological phenomena into the control<br>of aerodrome traffic. | 4 | <i>Optional content: Clouds,<br/>Precipitation, Visibility, Wind,<br/>Meteorological hazards</i>                              | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.7.6<br>10.6.6                          | Integrate the information provided by<br>situation displays.                                      | 4 | Use, Advantages, Disadvantages  | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.7.7                                    | Initiate missed approach.   | 3 | <i>Optional content: obstructed runway</i>  | ADV<br>ADI |
| Subtopic ATM 10. Runway in use                             |   |   |   |            |
| ADI (TWR)<br>ATM 10.8.1<br>10.7.1                          | Select the runway in use.   | 5 | ICAO Doc 4444   | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.8.2<br>10.7.2                          | Coordinate runway in use.   | 4 | <i>Optional content: Approach control,<br/>Area control, runway selection, change<br/>of runway</i>                           | ADV<br>ADI |
| ADI (TWR)<br>ATM 10.8.3<br>10.7.3                          | Manage traffic in the event of runway-in-<br>use change.  | 4 |   | ADV<br>ADI |
| TOPIC ATM 11 PROVISION OF AERODROME CONTROL - INSTRUMENT   |   |   |   |            |
| Subtopic ATM 11. Low visibility operations and special VFR |   |   |   |            |
| ADI (TWR)<br>ATM 11.1.1                                    | Manage SVFR traffic.  | 4 | ICAO Doc 4444   | ADI        |



|  |  |   |  |     |
|--|--|---|--|-----|
| ADI (TWR)<br>ATM 11.1.2  | Describe the Procedures for Low Visibility Operations.                                   | 2 | ICAO Doc 4444  | ADI |
| <b>Subtopic ATM 11. Departing traffic</b>                                      |  |   |  |     |
| ADI (TWR)<br>ATM 11.2.1  | Manage control of departing aircraft.  | 4 | ICAO Doc 4444, Use of situation displays, Wake turbulence, Appropriate departure clearances, SIDs  | ADI |
| ADI (TWR)<br>ATM 11.2.2  | Integrate departure sequence into the control of aerodrome traffic.                      | 4 | ICAO Doc 4444  | ADI |
| ADI (TWR)<br>ATM 11.2.3  | Provide appropriate information to departing traffic.                                    | 4 | ICAO Doc 4444, Use of situation displays, Wake turbulence  | ADI |
| <b>Subtopic ATM 11. Arriving traffic</b>                                       |  |   |  |     |
| ADI (TWR)<br>ATM 11.3.1  | Manage control of arriving aircraft.   | 4 | ICAO Doc 4444, Wake turbulence   | ADI |
| ADI (TWR)<br>ATM 11.3.2  | Integrate the approach sequence into the control of aerodrome traffic.                   | 4 | ICAO Doc 4444  | ADI |
| ADI (TWR)<br>ATM 11.3.3  | Integrate aircraft on visual approach into the aerodrome traffic.                        | 4 | ICAO Doc 4444  | ADI |
| ADI (TWR)<br>ATM 11.3.4  | Integrate aircraft on missed approach into the aerodrome traffic.                        | 4 | ICAO Doc 4444, Use of air traffic monitors   | ADI |
| ADI (TWR)<br>ATM <del>11.3.5</del>   | <del>Appreciate expected approach times:</del>   | 3 | <del>ICAO Doc 4444</del>   | ADI |
| ADI (TWR)<br>ATM 11.3.5<br>11.3.6  | Integrate aircraft performing circling approach into the aerodrome traffic.              | 4 | ICAO Doc 8168  | ADI |
| ADI (TWR)<br>ATM 11.3.6<br>11.3.7  | Provide appropriate information to arriving aircraft.                                    | 4 | ICAO Doc 4444  | ADI |
| <b>Subtopic ATM 11. Aerodrome control service with advanced system support</b> |  |   |  |     |
| ADI (TWR)<br>ATM 11.4.1  | Appreciate the impact of advanced systems on the provision of aerodrome control service. | 3 | Optional content: surface manager (SMAN), departure manager (DMAN), automated conflicts/incursions tools, alarms and resolution advisory tools, automated assistance for surface movement planning and routing, enhanced vision technology in Low Visibility for controllers | ADI |

## Subject 4 : METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

### TOPIC MET 1 METEOROLOGICAL PHENOMENA

| Subtopic               | MET 1.1 Meteorological phenomena  |   |  |            |
|------------------------|---|---|--|------------|
| ADI (TWR)<br>MET 1.1.1 | Appreciate the impact of different cloud types.                         | 3 | Cumulus, Cumulonimbus<br><i>Optional content: Stratus, Nimbostratus, etc.</i>                                      | ADV<br>ADI |
| ADI (TWR)<br>MET 1.1.2 | Appreciate the impact of precipitation.                                 | 3 | Precipitation and Microphysics<br><i>Optional content: Rain, Snow, Sleet, Hail</i>                                 | ADV<br>ADI |
| ADI (TWR)<br>MET 1.1.3 | Appreciate the impact of atmospheric obscurity.                         | 3 | <i>Optional content: Advection fog, Radiation fog, Mixing, Evaporation, Mist, Drizzle</i>                          | ADV<br>ADI |
| ADI (TWR)<br>MET 1.1.4 | Appreciate the effect and impact of wind.                               | 3 | Gusting, Veering, Backing<br><i>Optional content: Land breezes, Sea breezes, Föhn</i>                              | ADV<br>ADI |
| ADI (TWR)<br>MET 1.1.5 | Appreciate the effect and danger of hazardous meteorological phenomena. | 3 | Wind shear, Turbulence, Thunderstorms, Icing, Microbursts  | ADV<br>ADI |
| ADI (TWR)<br>MET 1.1.6 | Appreciate the effect of a frontal system on aerodrome operations.      | 3 |  | ADV<br>ADI |
| ADI (TWR)<br>MET 1.1.7 | Integrate data about meteorological phenomena into provision of ATS.    | 4 | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena</i> | ALL        |

### TOPIC MET 2 SOURCES OF METEOROLOGICAL DATA

| Subtopic               | MET 2.1 Meteorological instruments  |   |   |            |
|------------------------|---|---|---|------------|
| ADI (TWR)<br>MET 2.1.1 | Extract information from meteorological instruments.                            | 3 | <i>Optional content: Anemometer, RVR indicator, Cloud base indicator, Ceilometer, Barometer</i> | ADV<br>ADI |
| Subtopic               | MET 2.2 Other sources of meteorological data                                    |   |   |            |
| ADI (TWR)<br>MET 2.2.1 | Decode information from-meteorological data displays.                           | 3 |   | ADV<br>ADI |
| ADI (TWR)<br>MET 2.2.2 | Use appropriate communication tools and networks to obtain meteorological data. | 3 |   | ADV<br>ADI |

---

|                        |  |   |   |            |
|------------------------|--|---|---|------------|
| ADI (TWR)<br>MET 2.2.3 | Relay meteorological information. <del>from</del><br><del>pilot reports.</del> | 3 | ICAO Doc 4444   | ADV<br>ADI |
|                        |  |   | <i>Optional content: flight information<br/>centre, adjacent ATS unit</i> |            |

---

## Subject 5 : NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

### TOPIC NAV 1 MAPS AND AERONAUTICAL CHARTS

| Subtopic               | NAV 1.1 Maps and charts   |   |  |     |
|------------------------|---|---|--|-----|
| ADI (TWR)<br>NAV 1.1.1 | Decode symbols and information displayed on aeronautical maps and charts. | 3 | Instrument approach charts, <a href="#">SID charts</a> , aerodrome charts, visual approach charts<br><br><i>Optional content: Military maps and charts</i> | ADI |
| ADI (TWR)<br>NAV 1.1.2 | Use relevant maps and charts.   | 3 | Instrument approach charts, SID charts, aerodrome charts, visual approach charts<br><br><i>Optional content: Military maps and charts</i>                  | ADI |

### TOPIC NAV 2 INSTRUMENTAL NAVIGATION

| Subtopic               | NAV 2.1 Navigational systems  |   |  |                          |
|------------------------|---|---|--|--------------------------|
| ADI (TWR)<br>NAV 2.1.1 | Describe the possible operational status of navigational systems.   | 2 | <i>Optional content: NDB, VOR, DME, ILS, MLS, ABAS, SBAS, GBAS, RNP</i>                              | ADI                      |
| ADI (TWR)<br>NAV 2.1.2 | Decode operational status displays of navigational systems.   | 3 | <i>Optional content: NDB, VOR, DME, ILS, MLS, D-GPS, RNAV, P-RNAV</i>                                | ADI                      |
| ADI (TWR)<br>NAV 2.1.3 | Appreciate the effect of precision, limitations and change of the operational status of navigational systems. | 3 | <i>Optional content: limitations, status, degraded procedures</i>                                    | ALL                      |
| ADI (TWR)<br>NAV 2.1.4 | Manage traffic in case of change in the operational status of navigational systems.                           | 4 | <i>Optional content: limitations, status of ground-based systems</i>                                 | ADI                      |
| Subtopic               | NAV 2.2 Stabilised approach   |   |  |                          |
| ADI (TWR)<br>NAV 2.2.1 | <a href="#">Describe the concept of stabilised approach.</a>  | 2 | <a href="#">ICAO Doc 8168, Regulation (EC) No 1899/2006</a><br><br><i>Optional content: SKYbrary</i> | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>NAV 2.2.2 | <a href="#">Appreciate the effect of late change of runway-in-use for landing aircraft.</a>                   | 3 |  | ADV<br>ADI               |
| Subtopic               | NAV 2.3 Instrument departures and arrivals  |   |  |                          |
| ADI (TWR)<br>NAV 2.3.1 | <a href="#">Characterise SIDs.</a>  | 2 |  | ADI<br>APP<br>APS        |

|   |   |   |   |                                 |
|---|---|---|---|---------------------------------|
| ADI (TWR)<br>NAV 2.3.2                          | Describe the phases of an instrument approach procedure.  | 2 |   | ADI                             |
| ADI (TWR)<br>NAV 2.3.3                          | Describe the relevant minima applicable for a precision/non-precision and visual approach.                                | 2 |   | ADI<br>APP<br>APS               |
| <b>Subtopic NAV 2.4 Satellite-based systems</b> |   |   |   |                                 |
| ADI (TWR)<br>NAV 2.4.1<br>2.2.1                 | State the different applications operations associated with of satellite-based systems relevant for aerodrome operations. | 1 | Optional content: NPA, APV-baro VNAV, APV, LPV, Precision approach, ICAO Doc 8168 Vol.2 | ADI                             |
| <b>Subtopic NAV 2.5 PBN applications</b>        |   |   |   |                                 |
| ADI (TWR)<br>NAV 2.5.1                          | State future PBN developments.  | 1 | A-RNP, APV<br>Optional content: RNP 3D, RNP 4D  | ADI<br>APP<br>ACP<br>APS<br>ACS |

## Subject 6 : AIRCRAFT

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

### TOPIC ACFT 1 AIRCRAFT INSTRUMENTS

| Subtopic                           | ACFT 1.1 Aircraft instruments   |   |   |                   |
|------------------------------------|---|---|---|-------------------|
| ADI (TWR)<br>ACFT 1.1.1            | Integrate <del>the information</del> <del>indication</del> from aircraft instruments provided by the pilot in the provision of ATS. | 4 | <del>Optional content: TCAS, wind shear indicator, weather radar</del>    | ALL               |
| ADI (TWR)<br>ACFT 1.1.2            | Explain the operation of aircraft radio equipment.  | 2 | Optional content: Radios (number of), emergency radios, <del>SELCAL</del> | ALL               |
| ADI (TWR)<br>ACFT 1.1.3            | Explain the operation of on-board surveillance equipment.   | 2 | Transponders: equipment Mode A, Mode C, Mode S, ADS capability            | ADI<br>APS<br>ACS |
| ADI (TWR)<br>ACFT <del>1.1.4</del> | <del>Explain the use and benefits of CPDLC.</del>   | 2 |   | ALL               |

### TOPIC ACFT 2 AIRCRAFT CATEGORIES

| Subtopic                | ACFT 2.1 Wake turbulence <del>categories</del>  |   |               |                   |
|-------------------------|---|---|---------------|-------------------|
| ADI (TWR)<br>ACFT 2.1.1 | Explain the wake turbulence effect and associated hazards to the succeeding aircraft.                     | 2 |               | ALL               |
| ADI (TWR)<br>ACFT 2.1.2 | Appreciate the techniques used to prevent hazards associated with wake turbulence on succeeding aircraft. | 3 |               | ALL               |
| Subtopic                | ACFT 2.2 Application of ICAO approach categories  |   |               |                   |
| ADI (TWR)<br>ACFT 2.2.1 | Describe the use of ICAO approach categories.   | 2 | ICAO Doc 8168 | ADI<br>APP<br>APS |
| ADI (TWR)<br>ACFT 2.2.2 | Appreciate the effect of ICAO approach categories on the traffic organisation.                            | 3 |               | ADI<br>APP<br>APS |

### TOPIC ACFT 3 FACTORS AFFECTING AIRCRAFT PERFORMANCE

| Subtopic                | ACFT 3.1 Take-off factors  |   |  |            |
|-------------------------|--|---|--|------------|
| ADI (TWR)<br>ACFT 3.1.1 | Integrate the influence of factors affecting aircraft on take-off. | 4 | Optional content: runway conditions, runway slope, aerodrome elevation, wind, temperature, <del>aircraft configuration, airframe contamination and aircraft mass</del> | ADV<br>ADI |
| Subtopic                | ACFT 3.2 Climb factors   |   |  |            |

|   |   |   |   |            |
|---|---|---|---|------------|
| ADI (TWR)<br>ACFT 3.2.1                                     | Appreciate the influence of factors affecting aircraft during climb.  | 3 | <i>Optional content: speed, mass, air density, wind and temperature</i>   | ADV<br>ADI |
| <b>Subtopic ACFT 3.3 Final approach and landing factors</b> |   |   |   |            |
| ADI (TWR)<br>ACFT 3.3.1                                     | Integrate the influence of factors affecting aircraft during final approach and landing.  | 4 | <i>Optional content: wind, aircraft configuration, mass, runway conditions, runway slope, aerodrome elevation</i>       | ADV<br>ADI |
| <b>Subtopic ACFT 3.4 Economic factors</b>                   |   |   |   |            |
| ADI (TWR)<br>ACFT 3.4.1                                     | Integrate consideration of economic factors affecting aircraft.   | 4 | <i>Optional content: Starting-up, Taxiing, Routing, Departure sequence</i>  | ADV<br>ADI |
| <b>Subtopic ACFT 3.5 <del>Miscellaneous factors</del></b>   |   |   |   |            |
| ADI (TWR)<br>ACFT 3.5.1<br>10.1.5 ATM                       | Appreciate the influence of operational requirements.   | 3 | <del><i>Optional content: Military flying, Calibration flights, Aerial photography, banner towing</i></del>             | ADV<br>ADI |
| <b>Subtopic ACFT 3.5 Environmental factors</b>              |   |   |   |            |
| ADI (TWR)<br>ACFT 3.5.1<br>3.6.1                            | Appreciate the performance restrictions due to environmental constraints.<br><del>Estimate the influence of ecological factors affecting aircraft.</del>                                | 3 | <i>Optional content: Noise abatement procedures, Minimum flight altitudes, Bird hazard</i>                              | ADV<br>ADI |
| <b>TOPIC ACFT 4 AIRCRAFT DATA</b>                           |   |   |   |            |
| <b>Subtopic ACFT 4.1 Recognition of aircraft types</b>      |   |   |   |            |
| ADI (TWR)<br>ACFT 4.1.1                                     | Characterise a representative sample of aircraft which will be encountered in the operational/working environment.  | 2 | Recognition, ICAO type designators, Wake Turbulence Categories<br><br><i>Optional content: ICAO Approach Categories</i> | ADI        |
| <b>Subtopic ACFT 4.2 Performance data</b>                   |   |   |   |            |
| ADI (TWR)<br>ACFT 4.2.1                                     | Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/working environment into the provision of a control service. | 4 | Performance data under a representative variety of circumstances  | ADV<br>ADI |
| ADI (TWR)<br>ACFT 4.2.2<br>1.1.2 ABES                       | <del>Identify potential or actual emergency situations.</del>   | 3 |   | ADV<br>ADI |

## Subject 7 : HUMAN FACTORS

The subject objective is:

Learners shall ~~+~~ recognise the necessity to constantly extend their knowledge ~~;~~ and ~~it~~ analyse factors which affect personal and team performance.

### TOPIC HUM 1 PSYCHOLOGICAL FACTORS

| Subtopic               | HUM 1.1 Cognitive  |   |   |     |
|------------------------|--|---|---|-----|
| ADI (TWR)<br>HUM 1.1.1 | Describe the human information processing model.                               | 2 | Attention, perception, memory, situational awareness, decision making, response                                   | ALL |
| ADI (TWR)<br>HUM 1.1.2 | Describe the factors which influence human information processing.             | 2 | Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations | ALL |
| ADI (TWR)<br>HUM 1.1.3 | Monitor the effect of human information processing factors on decision making. | 3 | <i>Optional content: workload, stress, interpersonal relations, distraction, confidence</i>                       | ALL |

### TOPIC HUM 2 MEDICAL AND PHYSIOLOGICAL FACTORS

| Subtopic               | HUM 2.1 Fatigue  |   |  |     |
|------------------------|--|---|--|-----|
| ADI (TWR)<br>HUM 2.1.1 | State factors that cause fatigue.  | 1 | Shift work<br><br><i>Optional content: night shifts and rosters</i>  | ALL |
| ADI (TWR)<br>HUM 2.1.2 | Describe the onset of fatigue.   | 2 | <i>Optional content: Lack of concentration, Listlessness, Irritability, Frustration, ICAO Circular 241 – AN/145 Human factors in Air Traffic Control</i> | ALL |
| ADI (TWR)<br>HUM 2.1.3 | Recognise the onset of fatigue in self.  | 1 | <i>Optional content: ICAO Circular 241 – AN/145 Human factors in Air Traffic Control</i>   | ALL |
| ADI (TWR)<br>HUM 2.1.4 | Recognise the onset of fatigue in others.  | 1 |  | ALL |
| ADI (TWR)<br>HUM 2.1.5 | <del>Describe</del> <del>Consider</del> appropriate action when recognising fatigue. | 2 |  | ALL |
| Subtopic               | HUM 2.2 Fitness  |   |  |     |
| ADI (TWR)<br>HUM 2.2.1 | Recognise signs of lack of personal fitness.   | 1 |  | ALL |
| ADI (TWR)<br>HUM 2.2.2 | Describe actions when aware of a lack of personal fitness.                           | 2 |  | ALL |



**TOPIC HUM 3 SOCIAL AND ORGANISATIONAL FACTORS**

| <b>Subtopic HUM 3.1 Team resource management (TRM)</b> |   |   |  |     |
|--|---|---|--|-----|
| ADI (TWR)<br>HUM 3.1.1                                 | State the <b>relevance objectives</b> of TRM.               | 1 | <i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>                                      | ALL |
| ADI (TWR)<br>HUM 3.1.2                                 | State the content of the TRM concept.                       | 1 | <i>Optional content: team work, human error, team roles, stress, decision making, communication, situational awareness</i>           | ALL |
| <b>Subtopic HUM 3.2 Teamwork and team roles</b>        |   |   |  |     |
| ADI (TWR)<br>HUM 3.2.1                                 | Identify reasons for conflict.                              | 3 |  | ALL |
| ADI (TWR)<br>HUM 3.2.2                                 | Describe actions to prevent human conflicts.                | 2 | <i>Optional content: TRM team roles</i>  | ALL |
| ADI (TWR)<br>HUM 3.2.3                                 | Describe strategies to cope with human conflicts.           | 2 | <i>Optional content: in your team, in the simulator</i>  | ALL |
| <b>Subtopic HUM 3.3 Responsible behaviour</b>          |   |   |  |     |
| ADI (TWR)<br>HUM 3.3.1                                 | Consider the factors which influence responsible behaviour. | 2 | <i>Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality</i> | ALL |
| ADI (TWR)<br>HUM 3.3.2                                 | Apply responsible judgement.                                | 3 | Case study and discussion about a dilemma situation  | ALL |

**TOPIC HUM 4 STRESS**

| <b>Subtopic HUM 4.1 Stress</b>            |   |   |  |     |
|---|---|---|--|-----|
| ADI (TWR)<br>HUM 4.1.1                    | Recognise the effects of stress on performance.   | 1 | Stress and its symptoms in self and in others  | ALL |
| <b>Subtopic HUM 4.2 Stress management</b> |   |   |  |     |
| ADI (TWR)<br>HUM 4.2.1                    | Act to reduce stress.   | 3 | The effect of personality in coping with stress, The benefits of active stress management                | ALL |
| ADI (TWR)<br>HUM 4.2.2                    | Respond to stressful situation by offering, asking or accepting assistance. <del>Obtain assistance in stressful situations.</del> | 3 | <i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i> | ALL |
| ADI (TWR)<br>HUM 4.2.3                    | Recognise the effect of shocking and stressful events.  | 1 | Self and others, Abnormal situations, CISM   | ALL |

|                        |  |   |   |     |
|------------------------|--|---|---|-----|
| ADI (TWR)<br>HUM 4.2.4 | Consider the benefits of Critical Incident Stress Management (CISM). | 2 |   | ALL |
| ADI (TWR)<br>HUM 4.2.5 | Explain procedures used following an incident/accident.              | 2 | <i>Optional content: CISM, Counselling, Human element</i> | ALL |

## TOPIC HUM 5 HUMAN ERROR

| Subtopic               | HUM 5.1 Human error  |   |  |     |
|------------------------|--|---|--|-----|
| ADI (TWR)<br>HUM 5.1.1 | Explain the relationship between error and safety.                               | 2 | Number and combination of errors, proactive versus reactive approach to discovery of error<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |
| ADI (TWR)<br>HUM 5.1.2 | Differentiate between the types of error.  | 2 | <i>Slips, Lapses, Mistakes</i><br><br><i>Optional content: <del>Slips, Lapses, Mistakes</del> ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>                          | ALL |
| ADI (TWR)<br>HUM 5.1.3 | Describe error-prone conditions.   | 2 | <i>Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences</i>  | ALL |
| ADI (TWR)<br>HUM 5.1.4 | Collect examples of different error types, their causes and consequences in ATC. | 3 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ADI (TWR)<br>HUM 5.1.5 | Explain how to detect errors to compensate for them.                             | 2 | STCA, MSAW, individual and collective strategy<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ADI (TWR)<br>HUM 5.1.6 | Execute corrective actions.  | 3 | Error compensation<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ADI (TWR)<br>HUM 5.1.7 | <i>Explain the importance of error management.</i>                               | 2 | <i>Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practises</i>  | ALL |
| ADI (TWR)<br>HUM 5.1.8 | <i>Describe the impact on an ATCO following an occurrence/incident.</i>          | 2 | <i>Optional content: reporting, SMS, investigation, CISM</i>   | ALL |

## Subtopic HUM 5.2 Violation of rules

|                        |   |   |  |     |
|------------------------|---|---|--|-----|
| ADI (TWR)<br>HUM 5.2.1 | Explain the causes and dangers of violation of rules becoming accepted as a practice. | 2 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |
|------------------------|---|---|--|-----|

## TOPIC HUM 6 ~~WORKING METHODS~~

| Subtopic                          | HUM 6.1 <del>Efficiency</del>  |   |   |     |
|-----------------------------------|--|---|---|-----|
| ADI (TWR)<br>HUM <del>6.1.1</del> | <del>Consider, from a human factors point of view, the factors affecting efficiency in the provision of air traffic control.</del> | 2 | <del><i>Optional content: Own and others workload, OJT, customer requirements, economy, ecology, safety</i></del> | ALL |

## TOPIC HUM 6 COLLABORATIVE WORK

| Subtopic                            | HUM 6.1 Communication   |   |  |     |
|-------------------------------------|---|---|--|-----|
| ADI (TWR)<br>HUM 6.1.1<br>8.1.1     | Use communication effectively in ATC.                                     | 3 |  | ALL |
| ADI (TWR)<br>HUM 6.1.2<br>2.1.3 ATM | Analyse examples of pilot and controller communication for effectiveness. | 4 |  | ALL |

| Subtopic                        | HUM 6.2 Collaborative work within the same area of responsibility  |   |   |     |
|---------------------------------|--|---|---|-----|
| ADI (TWR)<br>HUM 6.2.1<br>8.2.1 | List communication means between controllers in charge of the same area of responsibility (sector or tower). | 1 | <i>Optional content: Electronic, written, verbal and non-verbal communication</i>     | ALL |
| ADI (TWR)<br>HUM 6.2.2<br>8.2.2 | Explain consequences of the use of communication means on effectiveness.                                     | 2 | <i>Optional content: Strips legibility and encoding, labels designation, Feedback</i> | ALL |
| ADI (TWR)<br>HUM 6.2.3<br>8.2.3 | List possible actions to provide a safe position handover.   | 1 | <i>Optional content: rigour, preparation, overlap time</i>                            | ALL |
| ADI (TWR)<br>HUM 6.2.4<br>8.2.4 | Explain consequences of a missed position handover process.  | 2 |   | ALL |

| Subtopic                        | HUM 6.3 Collaborative work between different areas of responsibility                         |   |   |     |
|---------------------------------|--|---|---|-----|
| ADI (TWR)<br>HUM 6.3.1<br>8.3.1 | List factors and means for an effective coordination between sectors and/or tower positions. | 1 | <i>Optional content: Other sectors constraints, electronic coordination tools</i> | ALL |

| Subtopic | HUM 6.4 Controller / pilot cooperation |  |  |  |
|----------|--|--|--|--|
|----------|--|--|--|--|

|   |  |   |  |     |
|---|--|---|--|-----|
| ADI (TWR)<br>HUM 6.4.1<br>8.4.1                     | Describe parameters affecting controller/pilot cooperation.  | 2 | <i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>                  | ALL |
| <b>TOPIC HUM 7 WORKING KNOWLEDGE</b>                |  |   |  |     |
| <b>Subtopic HUM 7.1 Controller knowledge</b>        |  |   |  |     |
| ADI (TWR)<br>HUM 7.1.1<br>1.1.2 LAW                 | Explain how to maintain and update professional knowledge to retain competence in the operational environment. | 2 | <i>Optional content: Briefing, LOAs, NOTAM, AICs, Reports of accident/incident, VOLMET, ATIS, SIGMET</i> | ALL |
| <b>TOPIC HUM 9 WORK ENVIRONMENT</b>                 |  |   |  |     |
| <b>Subtopic HUM 9.1 Ergonomics</b>                  |  |   |  |     |
| ADI (TWR)<br>HUM 9.1.1                              | <del>Appreciate the impact of working position ergonomics on controller activity.</del>                        | 3 |  | ALL |
| <b>TOPIC HUM 10 ATC SAFETY MANAGEMENT</b>           |  |   |  |     |
| <b>Subtopic HUM 10: Experience feedback</b>         |  |   |  |     |
| ADI (TWR)<br>HUM 10.1.1<br>3.1.1 LAW                | State the importance of the controllers contribution to the experience feedback process.                       | 1 | <i>Optional content: voluntary reporting</i>   | ALL |
| ADI (TWR)<br>HUM 10.1.2<br>3.1.2 LAW                | Describe how reported occurrences are analysed.  | 2 | <i>Optional content: ESARR2, local procedures</i>  | ALL |
| ADI (TWR)<br>HUM 10.1.3<br>3.1.3 LAW                | Name the means used to disseminate recommendations.  | 1 | <i>Optional content: Safety letters, safety boards web pages</i>   | ALL |
| ADI (TWR)<br>HUM 10.1.4<br>3.1.4 LAW                | Explain the "Just Culture" concept.  | 2 | <b>benefits, prerequisites, constraints</b><br><i>Optional content: EAM 2 GUI 6, GAIN Report</i>         | ALL |
| <b>Subtopic HUM 10: Safety investigation branch</b> |  |   |  |     |
| ADI (TWR)<br>HUM 10.2.1<br>3.2.1 LAW                | <del>Describe role and mission of Safety Investigation Branch in the improvement of safety.</del>              | 2 |  | ALL |
| ADI (TWR)<br>HUM 10.2.2<br>3.2.2 LAW                | <del>Define working methods of Safety Investigation Branch.</del>  | 1 |  | ALL |

## Subject 8 : EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall integrate knowledge and understanding of the basic working principles of equipment and systems and comply with the equipment and system degradation procedures in the provision of ATS.

### TOPIC EQPS 1 VOICE COMMUNICATIONS

| Subtopic                | EQPS 1.1 Radio communications                                  |   |  |     |
|-------------------------|--|---|--|-----|
| ADI (TWR)<br>EQPS 1.1.1 | Operate two-way communication equipment.                       | 3 | Transmit/receive switches, Procedures<br><i>Optional content: Frequency selection, Standby equipment</i> | ALL |
| ADI (TWR)<br>EQPS 1.1.2 | Identify indications of operational status of radio equipment. | 3 | <i>Optional content: Indicator lights, Serviceability displays, Selector/frequency displays</i>          | ALL |
| Subtopic                | EQPS 1.2 Other voice communications                            |   |  |     |
| ADI (TWR)<br>EQPS 1.2.1 | Operate landline communications.                               | 3 | <i>Optional content: telephone, interphone and intercom equipment</i>                                    | ALL |

### TOPIC EQPS 2 AUTOMATION IN ATS

| Subtopic                | EQPS 2.1 Aeronautical fixed telecommunication network (AFTN)                                |   |   |                          |
|-------------------------|---|---|---|--------------------------|
| ADI (TWR)<br>EQPS 2.1.1 | Decode AFTN messages.   | 3 | <i>Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.</i>     | ALL                      |
| Subtopic                | EQPS 2.2 Automatic data Interchange   |   |   |                          |
| ADI (TWR)<br>EQPS 2.2.1 | Use automatic data transfer equipment where available.                                      | 3 | <i>Optional content: Sequencing systems, Automated information and coordination, OLDI</i> | ADV<br>ADI<br>APS<br>ACS |
| ADI (TWR)<br>EQPS 2.2.2 | Explain operational application of CPDLC for departure clearance (DCL) delivery and D-ATIS. | 2 | ICAO Doc 9694   | ADV<br>ADI               |

### TOPIC EQPS 3 CONTROLLER WORKING POSITION

| Subtopic                | EQPS 3.1 Operation and monitoring of equipment                      |   |   |     |
|-------------------------|---|---|---|-----|
| ADI (TWR)<br>EQPS 3.1.1 | Monitor the technical integrity of the controller working position. | 3 | Notification procedures, Responsibilities   | ALL |
| ADI (TWR)<br>EQPS 3.1.2 | Operate the equipment of the controller working position.           | 3 | <i>Optional content: Situation displays, Flight progress board, Flight data display, Radio, Telephone, Maps and charts, Strip-printer, Clock, Information systems monitors, (ECIS), UDF/VDF</i> | ALL |

|   |  |   |  |            |
|---|--|---|--|------------|
| ADI (TWR)<br>EQPS 3.1.3   | Operate <del>all</del> available equipment in <del>unusual/degraded/abnormal</del> and emergency situations. | 3 |  | ALL        |
| <b>Subtopic EQPS 3.2 Situation displays and information systems</b>   |  |   |  |            |
| ADI (TWR)<br>EQPS 3.2.1   | Use situation displays.  | 3 |  | ALL        |
| ADI (TWR)<br>EQPS 3.2.2   | Check availability of information material.  | 3 |  | ALL        |
| ADI (TWR)<br>EQPS 3.2.3   | Obtain information from equipment.   | 3 | <i>Optional content: information from wind direction indicator</i>             | ADV<br>ADI |
| ADI (TWR)<br>EQPS 3.2.4   | Take account of anti-incursion equipment.  | 2 |  | ADI        |
| ADI (TWR)<br>EQPS 3.2.5   | Explain the use of ASMGCS.   | 2 |  | ADI        |
| <b>Subtopic EQPS 3.3 Flight data systems</b>                          |  |   |  |            |
| ADI (TWR)<br>EQPS 3.3.1   | Use the flight data information at controller working position.  | 3 |  | ALL        |
| <b>TOPIC EQPS 4 FUTURE EQUIPMENT</b>                                  |  |   |  |            |
| <b>Subtopic EQPS 4.1 New developments</b>                             |  |   |  |            |
| ADI (TWR)<br>EQPS 4.1.1   | Recognise future developments.   | 1 | New advanced systems   | ALL        |
| <b>TOPIC EQPS 5 EQUIPMENT AND SYSTEMS LIMITATIONS AND DEGRADATION</b> |  |   |  |            |
| <b>Subtopic EQPS 5.1 Reaction to limitations</b>                      |  |   |  |            |
| ADI (TWR)<br>EQPS 5.1.1   | Take account of the limitations of equipment and systems.  | 2 |  | ALL        |
| ADI (TWR)<br>EQPS 5.1.2   | Respond to technical deficiencies of the operational position.   | 3 | Notification procedures, Responsibilities                                      | ALL        |
| <b>Subtopic EQPS 5.2 Communication equipment degradation</b>          |  |   |  |            |
| ADI (TWR)<br>EQPS 5.2.1   | Identify that communication equipment has degraded.  | 3 | <i>Optional content: Ground-air, ground-ground and landline communications</i> | ADV<br>ADI |

|   |  |   |  |                                 |
|---|--|---|--|---------------------------------|
| ADI (TWR)<br>EQPS 5.2.2                                     | Integrate contingency procedures in the event of communication equipment degradation.  | 4 | <i>Optional content: total or partial degradation of ground-air, ground-ground and landline communications; Alternative methods of transferring data</i> | ADV<br>ADI                      |
| <b>Subtopic EQPS 5.3 Navigational equipment degradation</b> |  |   |  |                                 |
| ADI (TWR)<br>EQPS 5.3.1                                     | Identify when a navigational equipment failure will affect operational ability.        | 3 | <i>Optional content: VOR, Navigational aids</i>  | ALL                             |
| ADI (TWR)<br>EQPS 5.3.2                                     | Integrate contingency procedures in the event of a navigational equipment degradation. | 3 | <i>Optional content: Vertical separation, Information to aircraft, Navigational assistance, Seeking assistance from adjacent units</i>                   | ADI<br>APP<br>ACP<br>APS<br>ACS |

## Subject 9 : PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

| TOPIC PEN 1 FAMILIARISATION PROFESSIONAL ENVIRONMENT                                       |   |   |  |     |                   |
|--|---|---|--|-----|-------------------|
| Subtopic PEN 1.1 Study visit to aerodrome  |   |   |  |     |                   |
| ADI (TWR)  | Appreciate the functions and provision of an operational aerodrome control service.               | 3 | study visit to TWR   | ADV | ADI               |
| PEN 1.1.1  |   |   |  |     |                   |
| TOPIC PEN 2 AIRSPACE USERS   |   |   |  |     |                   |
| Subtopic PEN 2.1 Contributors to civil ATS operations                                      |   |   |  |     |                   |
| ADI (TWR)  | Characterise civil <del>and military</del> ATS activities at aerodrome.                           | 2 | study visit to TWR   | ADV | ADI               |
| PEN 2.1.1  |   |   |  |     |                   |
| 1.1.1  |   |   | Optional content: Familiarisation visits to <del>e.g. TWR, APP, ACC, AIS, RCC, Air Defence Units</del>   |     |                   |
| ADI (TWR)  | Characterise other parties interfacing with ATS operations.                                       | 2 | Optional content: familiarisation visits to engineering services, fire and emergency services, airline operations offices                                | ALL |                   |
| PEN 2.1.2  |   |   |  |     |                   |
| 1.1.2  |   |   |  |     |                   |
| Subtopic PEN 2.2 Contributors to military ATS operations                                   |   |   |  |     |                   |
| ADI (TWR)  | Characterise <del>civil and</del> military ATS activities.  | 2 | Optional content: Familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units   | ALL |                   |
| PEN 2.2.1  |   |   |  |     |                   |
| 1.1.1  |   |   |  |     |                   |
| TOPIC PEN 3 CUSTOMER RELATIONS   |   |   |  |     |                   |
| Subtopic PEN 3.1 <del>Customer relations</del> Provision of services and user requirements |   |   |  |     |                   |
| ADI (TWR)  | Identify the role of ATC as a service provider. <del>and the requirements of the ATS users.</del> | 3 | <del>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</del> | ALL |                   |
| PEN 3.1.1  |   |   |  |     |                   |
| 1.2.1  |   |   |  |     |                   |
| ADI (TWR)  | Appreciate ATS users requirements.  | 3 | <del>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</del> | ALL |                   |
| PEN 3.1.2  |   |   |  |     |                   |
| 1.2.1  |   |   |  |     |                   |
| TOPIC PEN 4 ENVIRONMENTAL PROTECTION   |   |   |  |     |                   |
| Subtopic PEN 4.1 Environmental protection  |   |   |  |     |                   |
| ADI (TWR)  | Describe the environmental constraints on aerodrome operations.                                   | 2 | Optional content: ICAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions  | ADV | ADI<br>APP<br>APS |
| PEN 4.1.1  |   |   |  |     |                   |



|                                 |   |   |   |                          |
|---------------------------------|---|---|---|--------------------------|
| ADI (TWR)<br>PEN 4.1.2<br>1.3.1 | Explain the use of Collaborative Environmental Management (CEM) process at airports. <del>Describe processes used to ensure environmental protection.</del> | 2 | <del>Optional content: night curfews, relations with local community, relations with environmental associations, relevant administrations</del> | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>PEN 4.1.3          | Appreciate the mitigation techniques used at aerodromes to minimise aviation's impact on the environment.   | 3 | Optional content: Noise abatement procedures, flight efficiency   | ADV<br>ADI               |

## Subject 10: ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in ~~unusual, degraded~~ abnormal and emergency situations.

### TOPIC ABES 1 ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS (ABES)

| Subtopic                              | ABES 1.1 Overview of <del>UDES</del> ABES  |   |   |            |
|---------------------------------------|--|---|---|------------|
| ADI (TWR)<br>ABES 1.1.1               | List common <del>unusual/degraded</del> abnormal and emergency situations.   | 1 | Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, <del>GPWS</del> ground based safety nets alerts, airframe failure, unreliable instruments, runway incursion | ALL        |
| ADI (TWR)<br>ABES 1.1.2<br>4.1.2 ACFT | Identify potential or actual abnormal and emergency situations.  | 3 |   | ALL        |
| ADI (TWR)<br>ABES 1.1.3<br>1.1.2      | Take into account the procedures for given <del>unusual/degraded</del> abnormal and emergency situations.            | 2 | Bird strike, aborted take-off<br>Optional content: ICAO Doc 4444  | ADV<br>ADI |
| ADI (TWR)<br>ABES 1.1.4<br>1.1.3      | Take into account that procedures don't exist for all <del>unusual/degraded</del> abnormal and emergency situations. | 2 | Optional content: real life examples  | ALL        |
| ADI (TWR)<br>ABES 1.1.5<br>1.1.4      | Consider how the evolution of a situation may have an impact on safety.  | 2 | Optional content: Separation, Information, Coordination   | ALL        |

### TOPIC ABES 2 SKILLS IMPROVEMENT

| Subtopic                | ABES 2.1 Communication effectiveness   |   |   |     |
|-------------------------|--|---|---|-----|
| ADI (TWR)<br>ABES 2.1.1 | Ensure effective communication in all circumstances including the case where standard phraseology is not applicable. | 4 | Phraseology, Vocabulary, Readback, Silence instruction                        | ALL |
| ADI (TWR)<br>ABES 2.1.2 | Apply change of radiotelephony call sign.  | 3 | ICAO Doc 4444   | ALL |
| Subtopic                | ABES 2.2 Avoidance of mental overload  |   |   |     |
| ADI (TWR)<br>ABES 2.2.1 | Describe actions to keep the control of the situation.   | 2 | Optional content: sector splitting, holding, flow management, task delegation | ALL |
| ADI (TWR)<br>ABES 2.2.2 | Organise priority of actions.  | 4 |   | ALL |

|   |  |   |  |     |
|---|--|---|--|-----|
| ADI (TWR)<br>ABES 2.2.3   | Ensure an effective circulation of information.  | 4 | <i>Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.</i>  | ALL |
| ADI (TWR)<br>ABES 2.2.4   | Consider asking for help.  | 2 |  | ALL |
| <b>Subtopic ABES 2.3 Air / ground cooperation</b>                                     |  |   |  |     |
| ADI (TWR)<br>ABES 2.3.1   | Collect appropriate information relevant for the situation.  | 3 |  | ALL |
| ADI (TWR)<br>ABES 2.3.2   | Assist the pilot.  | 3 | <b>Pilot workload</b><br><i>Optional content: Instructions, information, support, human factors, etc.</i>  | ALL |
| <b>TOPIC ABES 3 PROCEDURES FOR UNUSUAL/DEGRADED/ABNORMAL AND EMERGENCY SITUATIONS</b> |  |   |  |     |
| <b>Subtopic ABES 3.1 Application of procedures for UNDES ABES</b>                     |  |   |  |     |
| ADI (TWR)<br>ABES 3.1.1   | Apply the procedures for given <del>unusual/degraded</del> abnormal and emergency situations.          | 3 | <i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, GPWS ground based safety nets alerts, airframe failure</i>                            | ALL |
| ADI (TWR)<br>ABES 3.1.1   | Apply the procedures for given <del>unusual/degraded</del> abnormal and emergency situations.          | 3 | <b>Runway incursion</b><br><i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, GPWS ground based safety nets alerts, airframe failure</i> | ADI |
| <b>Subtopic ABES 3.2 Radio failure</b>  |  |   |  |     |
| ADI (TWR)<br>ABES 3.2.1   | Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure. | 2 | <b>ICAO Doc 7030</b><br><i>Optional content: military procedures</i>   | ALL |
| ADI (TWR)<br>ABES 3.2.2   | Apply the procedures to be followed when a pilot experiences complete or partial radio failure.        | 3 | <i>Optional content: Prolonged loss of communication</i>   | ALL |
| <b>Subtopic ABES 3.3 Unlawful interference and aircraft bomb threat</b>               |  |   |  |     |
| ADI (TWR)<br>ABES 3.3.1   | Apply ATC procedures associated with unlawful interference and aircraft bomb threat.                   | 3 | <b>ICAO Doc 4444</b>   | ALL |
| <b>Subtopic ABES 3.4 Strayed or unidentified aircraft</b>                             |  |   |  |     |

|   |  |   |  |            |
|---|--|---|--|------------|
| ADI (TWR)<br>ABES 3.4.1                   | Apply the procedures in the case of strayed aircraft.      | 3 | ICAO Doc 4444<br><i>Optional content: Inside controlled airspace, Outside controlled airspace</i>  | ALL        |
| ADI (TWR)<br>ABES 3.4.2                   | Apply the procedures in the case of unidentified aircraft. | 3 | ICAO Doc 4444  | ALL        |
| ADI (TWR)<br>ABES 3.4.3                   | Provide navigational assistance to aircraft.               | 4 | <i>Optional content: diverted aircraft, aircraft lost or unsure of position, information derived locally or from radar service or from other pilots, Nearest most suitable aerodrome, Track, Heading, Distance, Aerodrome information, Any other relevant navigational assistance, ICAO Doc 4444, etc.</i> | ADV<br>ADI |
| <b>Subtopic ABES 3.5 Runway incursion</b> |  |   |  |            |
| ADI (TWR)<br>ABES 3.5.1                   | Apply ATC procedures associated with runway incursion.     | 3 | ICAO Doc 4444  | ADV<br>ADI |

## Subject 11: AERODROMES

The subject objective is:

Learners shall recognise and understand the design and layout of aerodromes.

### TOPIC AGA 1 AERODROME DATA, LAYOUT AND COORDINATION

| Subtopic                        | AGA 1.1 Definitions  |   |  |                          |
|---------------------------------|--|---|--|--------------------------|
| ADI (TWR)<br>AGA 1.1.1          | <del>Describe the general layout of an aerodrome with a single runway and multiple runways.</del>            | 2 | <del>ICAO Annex 14</del><br><i>Optional content: AIP</i>   | APP<br>APS<br>ADV<br>ADI |
| ADI (TWR)<br>AGA 1.1.1<br>1.1.2 | Define aerodrome data.   | 1 | ICAO Annex 14<br><i>Optional content: Aerodrome elevation, Reference point, Apron, Movement area, Manoeuvring area, Hot spot</i> | ADV<br>ADI<br>APP<br>APS |
| Subtopic                        | AGA 1.2 Coordination   |   |  |                          |
| ADI (TWR)<br>AGA 1.2.1          | Identify the information that has to be passed between Air Traffic Services (ATS) and the airport authority. | 3 | Airport conditions, Fire/rescue category, Condition of ground equipment and NAVAIDs, AIRAC, ICAO Annex 14                        | APP<br>APS<br>ADV<br>ADI |

### TOPIC AGA 2 MOVEMENT AREA

| Subtopic               | AGA 2.1 Movement area   |   |   |                          |
|------------------------|---|---|---|--------------------------|
| ADI (TWR)<br>AGA 2.1.1 | Describe movement area.   | 2 | ICAO Annex 14                                 | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.1.2 | Describe the marking of obstacles and unusable or unserviceable areas.                          | 2 | Flags, Signs on pavement, Lights              | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.1.3 | Identify the information on conditions of the movement area that have to be passed to aircraft. | 3 | Essential information on aerodrome conditions | ADV<br>ADI<br>APP<br>APS |
| Subtopic               | AGA 2.2 Manoeuvring area  |   |   |                          |
| ADI (TWR)<br>AGA 2.2.1 | Describe manoeuvring area.  | 2 | ICAO Annex 14                                 | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.2.2 | Describe taxiway.   | 2 |   | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.2.3 | Describe the daylight marking on taxiways.  | 2 |   | ADV<br>ADI<br>APP<br>APS |

|                                 |  |   |  |                          |
|---------------------------------|--|---|--|--------------------------|
| ADI (TWR)<br>AGA 2.2.4          | Describe taxiway lighting.                                       | 2 |  | ADV<br>ADI<br>APP<br>APS |
| <b>Subtopic AGA 2.3 Runways</b> |  |   |  |                          |
| ADI (TWR)<br>AGA 2.3.1          | Describe runway.   | 2 | Runway, Runway surface, Runway strip, Shoulder, Runway end safety areas, Clearways, Stopways   | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.2          | Describe instrument runway.                                      | 2 | ICAO Annex 14  | ADI<br>APP<br>APS        |
| ADI (TWR)<br>AGA 2.3.3          | Describe non-instrument runway.                                  | 2 | ICAO Annex 14  | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.4          | Explain declared distances.                                      | 2 | TORA, TODA, ASDA, LDA  | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.5          | Explain the differences between ACN and PCN.                     | 2 | Strength of pavements  | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.6          | Describe the daylight markings on runways.                       | 2 | <i>Optional content: Runway Designator, Centre line, Threshold, Aiming point, Fixed distance, Touchdown zone, Side strip, Colour</i> | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.7          | Describe runway lights.  | 2 | <i>Optional content: Colour, Centre line, Intensity, Edge, Touchdown zone, Threshold, Barettes</i>                                   | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.8          | Explain the functions of visual landing aids.                    | 2 | <i>Optional content: AVASI, VASI, PAPI</i>   | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.9          | Describe the approach lighting systems.                          | 2 | Centre line, cross bars, Stroboscopic lights, Colours, Intensity and brightness  | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.10         | Characterise the effect of water/ice on runways.                 | 2 |  | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.11         | Explain braking action.  | 2 | Braking action coefficient   | ADV<br>ADI<br>APP<br>APS |
| ADI (TWR)<br>AGA 2.3.12         | Explain the effect of runway visual range on aerodrome operation | 2 |  | ADV<br>ADI<br>APP<br>APS |

**TOPIC AGA 3 OBSTACLES****Subtopic AGA 3.1 Obstacle-free airspace around aerodromes**

|  |   |   |   |                          |
|--|---|---|---|--------------------------|
| ADI (TWR)<br>AGA 3.1.1                     | Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes. | 2 |   | ADV<br>ADI<br>APP<br>APS |
| <b>TOPIC AGA 4 MISCELLANEOUS EQUIPMENT</b> |   |   |   |                          |
| <b>Subtopic</b>                            | <b>AGA 4.1 Location</b>   |   |   |                          |
| ADI (TWR)<br>AGA 4.1.1                     | Explain the location of different aerodrome ground equipment.                                       | 2 | <i>Optional content: LLZ, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI</i> | ADV<br>ADI<br>APP<br>APS |

## Supplements

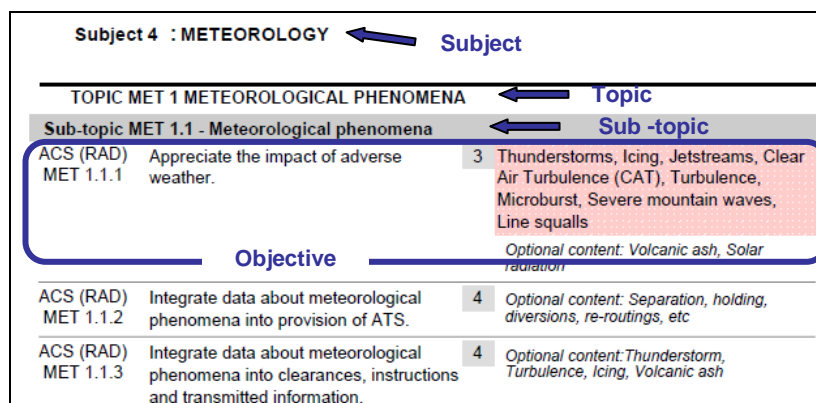


## Supplement 1

### SYLLABI STRUCTURE - HOW TO READ THE TABLES

#### 1. Structure of the Rating training syllabi

- a. Each Rating training has been structured as a syllabus, as follows:
  - i. Each syllabus is divided into subjects, which are divided into topics that are in turn divided into sub-topics. This structure is used to create and classify the objectives. There can be one or several objectives linked to each sub-topic.
  - ii. Objectives are assigned to a specific subject which deals with the knowledge and skills needed to accomplish the subject objective contained in Appendix 5 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(ii) Aerodrome Control Instrument Rating for Tower – ADI (TWR)).



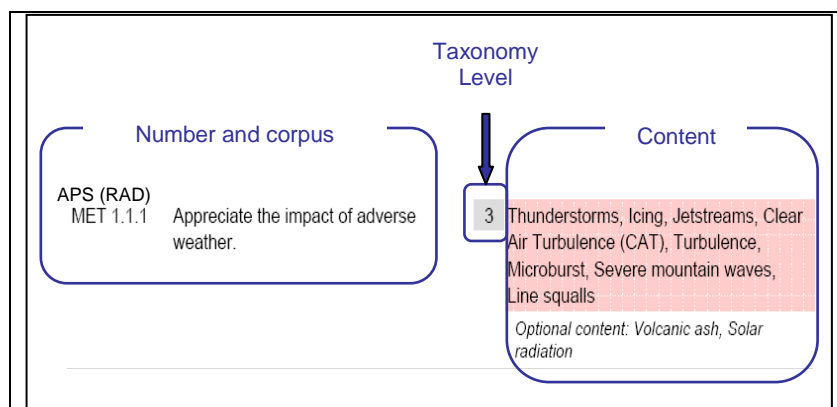
**Figure 1: Layout of syllabus**

- b. The following principles may be applied to the development of a training course that is based on any of the syllabi:
  - i. The structure of the syllabi and the order of the objectives contained within Appendix 5 to Regulation (EU) No .../... is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.
  - ii. No objective from the Basic syllabus is repeated as 'a refresher' in the Rating syllabi.
  - iii. The number of objectives contained within a sub-topic does not necessarily signify how long it should take to teach that sub-topic. For example, a sub-topic containing five relatively straightforward objectives, may take a shorter time to be taught than another sub-topic containing two complex objectives.

#### 2. Structure of objectives

- a. An objective consists of three elements:
  - i. The corpus, which is a description of the required performance. It always contains an action verb to ensure that the outcome is observable. The action verb is always associated with a defined taxonomy.

- ii. The level, which indicates numerically the taxonomy of the action verb.
- iii. The content, which may be implicit or explicit. The explicit content is written in the content field, while the implicit content is not but, instead, is implied in the corpus of the objective and other elements (syllabus, subject, etc.). Content that is a required part of the objective is written in the red shaded field. Optional content, written in italics, may be used if considered appropriate.



**Figure 2: Layout of an objective**

### 3. Repeated and common objectives

- a. Repeated and common objectives are only applicable to Rating training.
- b. To the right of each objective there is an indication of which other ratings contain this particular objective. This indication is the first step to help the training providers in identifying the potential commonalities between the various syllabi. As a second step, the training provider must determine, at the level of local implementation, whether the objective is to be regarded as repeated or common.

| TOPIC MET 1 - METEOROLOGICAL PHENOMENA      |  |   |   |                          |
|---|--|---|---|--------------------------|
| Subtopic MET 1.1 - Meteorological phenomena |  |   |   |                          |
| APS<br>MET 1.1.1                            | Appreciate the impact of adverse weather.                            | 3 | Thunderstorms, Icing, Clear Air Turbulence (CAT), Turbulence, Microburst, Wind shear, Severe mountain waves, Line squalls, Volcanic ash | APP<br>APS               |
| APS<br>MET 1.1.2                            | Integrate data about meteorological phenomena into provision of ATS. | 4 | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena</i>                      | ALL                      |
| APS<br>MET 1.1.3                            | Use techniques to avoid adverse weather when necessary/possible.     | 3 | Rerouting, level change, etc.   | APP<br>ACP<br>APS<br>ACS |

**Figure 3: Indication of the ratings that particular objective applies to.**

### 3.1 Repeated objectives

- a. All the objectives appearing in a syllabus are implicitly appropriate to this syllabus. As a consequence, objectives may be repeated 'verbatim' in different rating syllabi and nevertheless specify a different performance. The reader always needs to mentally add the sentence 'in this syllabus context' at the end of each objective.

*For example, the objective 'use approved phraseology' is repeated (same level, same corpus, same content) in all the syllabi but is different because the context is different in each syllabus (a learner able to use approved phraseology for en-route traffic will need additional training before mastering the phraseology in the provision of aerodrome control).*

### 3.2 Common objectives

- a. Common objectives are verbatim the same objectives that appear in more than one rating syllabi in the same context so that they do not need to be taught again in case of combined or successively organised courses.

*For example, the objective 'describe the human information processing model' is common for all the syllabi because the context is non-specific and is therefore not determined by the type of rating.*

- b. As a general principle, the rating subject Human Factors is identical in each Rating training syllabi and can be considered as containing common objectives because the context is always the same. This means that the rating training objectives relating to Human Factors need only be taught once. If a learner is acquiring an additional rating, he/she would not be required to repeat the Human Factors objectives.

#### 4. Action verbs that support the Taxonomy for training objectives:

- a. The five taxonomy levels should be understood to have the following levels of complexity:
- b. Action verbs for Level 1

Level 1 - A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

| L1 Verb          | Definition   | Example  |
|------------------|--|--|
| <b>Define</b>    | State what it is and what its limits are; state the definition | Define ATC service   |
| <b>Draw</b>      | Produce a picture, pattern or diagram                          | Draw the block diagram<br>Draw a holding pattern   |
| <b>List</b>      | Say one after the other  | List the main structure components of an aircraft  |
| <b>Name</b>      | Give name of objects or procedures                             | Name the components of an ILS<br>Name the key national and international aviation organisations. |
| <b>Quote</b>     | Repeat of what is written or said to underline                 | Quote ICAO definition of ATC service   |
| <b>Recognise</b> | To know what it is because you've seen it before               | Recognise the information contained in the different parts of the AIP.                           |
| <b>State</b>     | Say or write in a formal or definite way                       | State the meteorological hazards to aviation.  |

#### c. Action verbs for Level 2

Level 2 - The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

| L2 Verb              | Definition  | Example   |
|----------------------|---|---|
| <b>Characterise</b>  | To describe the quality of features in something                                  | Characterise the main items of ATC equipment                            |
| <b>Consider</b>      | To think carefully about it   | Consider the benefits of Critical Incident Stress Management (CISM).    |
| <b>Demonstrate</b>   | Describe and explain; logically or mathematically proves the truth of a statement | Demonstrate the importance of good communications in ATC.               |
| <b>Describe</b>      | Say what it is like or what happened  | Describe the methods by which ICAO notifies and implements legislation. |
| <b>Differentiate</b> | Show the differences  | Differentiate between different   |

|                        |   |  |
|------------------------|---|--|
|                        | between things  | types of visibility.   |
| <b>Explain</b>         | Give details about something or describe so that it can be understood | Explain the purpose and function of ICAO   |
| <b>Take account of</b> | Take into consideration before deciding                               | Take into account the wind influence when calculating a ground speed.<br>Take account of the limitations of equipment and systems. |

## d. Action verbs for Level 3

Level 3 - A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

| <b>L3 Verb</b>    | <b>Definition</b>   | <b>Example</b>   |
|-------------------|---|--|
| <b>Act</b>        | Carry out, execute  | Act to reduce stress.  |
| <b>Apply</b>      | Use something in a situation or activity  | Apply separation.  |
| <b>Appreciate</b> | To understand a situation and know what is involved in a problem-solving situation, to state a plan without applying it                                 | Appreciate the necessity for coordination. (The learner says that the coordination will be done and with whom, he/she does not perform the actual coordination). |
| <b>Assist</b>     | Help somebody to do a job by doing part of it   | Assist the pilot   |
| <b>Calculate</b>  | To discover from information you already have by arithmetic; to think about a possible cause of action in order to form an opinion or decide what to do | Calculate appropriate levels<br>Calculate conversions between the three north designations.  |
| <b>Check</b>      | Make sure the information is correct (satisfactory)   | Check the accuracy of flight data information<br>Check availability of information material.   |
| <b>Choose</b>     | Select out of number, decide to do one thing rather than another  | Choose appropriate levels.<br>Choose which aircraft should be vectored   |
| <b>Collect</b>    | Assemble, accumulate, bring or come together  | Collect examples of different types of error, their causes and consequences in ATC.  |
| <b>Conduct</b>    | Lead, guide   | Conduct coordination   |
| <b>Confirm</b>    | Establish more firmly, corroborate  | Confirm sequence order   |
| <b>Decode</b>     | Turn into ordinary writing, decipher  | Decode the content of weather reports and forecast   |
| <b>Encode</b>     | Put into code or cipher   | Encode and decode flight plans (including supplementary information).  |
| <b>Estimate</b>   | Form an approximate judgement of a number, form an opinion  | Estimate distance and direction between two points   |
| <b>Execute</b>    | Perform action  | Execute corrective actions.  |
| <b>Extract</b>    | Copy out, make extracts from, find, deduce  | Extract pertinent data from relevant sources to produce a flight progress  |

| L3 Verb         | Definition  | Example   |
|-----------------|---|---|
|                 |   | display.  |
| <b>Identify</b> | Associate oneself inseparably with, establish the identity  | Identify the role of ATC as a service provider and the requirements of the ATS users.<br>Identify an aircraft |
| <b>Inform</b>   | Inspire, tell   | Inform supervisor of situation.   |
| <b>Initiate</b> | Begin, set going, originate   | Initiate appropriate coordination   |
| <b>Input</b>    | Enter in the system   | Input data  |
| <b>Issue</b>    | Send forth, publish   | Issue appropriate ATC clearances.<br>Issue appropriate traffic information.                                   |
| <b>Maintain</b> | Carry on, keep up, refresh  | Maintain flight data display  |
| <b>Measure</b>  | Ascertain extent or quality of (thing) by comparison with fixed unit or with object of known size | Measure distance on a map   |
| <b>Monitor</b>  | Keep under observation  | Monitor traffic<br>Monitor the effect of human information processing factors on decision making.             |
| <b>Notify</b>   | Make known, announce, report  | Notify runway in use  |
| <b>Obtain</b>   | Acquire easily, without research  | Obtain meteorological information<br>Obtain information from the relieving controller.                        |
| <b>Operate</b>  | Conduct work on equipment   | Operate the equipment of the controller working position.   |
| <b>Pass</b>     | Move, cause to go, transmit   | Pass essential traffic information without delay  |
| <b>Perform</b>  | Carry into effect, go through, execute  | Perform communication effectively   |
| <b>Process</b>  | To put through the steps of a prescribed procedure  | Process pertinent data on data displays.  |
| <b>Record</b>   | Register, set down for remembrance or reference   | Record information by writing effectively   |
| <b>Relay</b>    | Arrange in, provide with, replace by ...  | Relay meteorological information from pilot reports.  |
| <b>Respond</b>  | Make answer, perform answering or corresponding action  | Respond to loss/doubt concerning identification.<br>Respond to distress and urgency messages and signals.     |
| <b>Scan</b>     | Continuously observe rapidly, sequentially and selectively in order to                            | Scan data display   |

| L3 Verb         | Definition   | Example  |
|-----------------|--|--|
|                 | extract relevant data  |  |
| <b>Transfer</b> | Hand over  | Transfer information to the relieving controller                       |
| <b>Update</b>   | Refresh, bring up-to-date                                      | Update the data display to accurately reflect the traffic situation.   |
| <b>Use</b>      | Employ for a purpose, handle as instrument, put into operation | Use approved phraseology.<br>Use the available means for coordination. |
| <b>Verify</b>   | Establish truth of   | Verify the mode C information  |

## e. Action verbs for Level 4

Level 4 - Ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problem situation. This involves the integration of known applications in a familiar situation.

| L4 Verb           | Definition   | Example   |
|-------------------|--|---|
| <b>Acquire</b>    | Gain by oneself and for oneself, obtain after research | Acquire relevant aeronautical information   |
| <b>Adjust</b>     | Change to a new position, value or setting             | Adjust the surveillance system display  |
| <b>Allocate</b>   | Assign, devote   | Allocate levels (height, altitude, flight level) according to altimetry data.   |
| <b>Analyse</b>    | Examine minutely the constitution of                   | Analyse examples of pilot and controller communication for effectiveness.<br>Analyse the information provided by the radar equipment. |
| <b>Assign</b>     | Allot as a share, make over                            | Assign codes.   |
| <b>Coordinate</b> | Bring part into proper relation                        | Coordinate runway in use.<br>Coordinate in the provision of FIS.  |
| <b>Comply</b>     | Act in accordance with                                 | Comply with rules   |
| <b>Delegate</b>   | Commit authority to somebody                           | Delegate separation to pilots in the case of aircraft executing successive visual approaches.   |
| <b>Detect</b>     | Discover existence of                                  | Detect potential conflict   |
| <b>Ensure</b>     | Make safe, make certain                                | Ensure the agreed course of action is carried out   |
| <b>Expedite</b>   | Assist the progress of, do speedily                    | Expedite traffic  |
| <b>Integrate</b>  | Combine into a whole, complete by addition of          | Integrate appropriate ATC clearances in control service.  |



| L4 Verb         | Definition  | Example  |
|-----------------|---|--|
|                 | parts   |  |
| <b>Manage</b>   | Handle, wield, conduct                                      | Manage traffic on the manoeuvring area.<br>Manage traffic in accordance with procedural changes. |
| <b>Organise</b> | Give orderly structure to, frame and put into working order | Organise pertinent data on data displays.<br>Organise priority of actions.                       |
| <b>Predict</b>  | Forecast  | Predict positions of aircraft in the aerodrome traffic and taxi circuits.                        |
| <b>Provide</b>  | Supply, furnish   | Provide radar separation.<br>Provide FIS.  |
| <b>Relate</b>   | Establish link with   | Relate a pressure setting to an altitude   |

## f. Action verbs for Level 5

Level 5 - Ability to analyse new situation in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different from those previously met, requiring judgement and evaluation of options.

| L5 verb          | Definition   | Example   |
|------------------|--|---|
| <b>Assess</b>    | Estimate value or difficulty, evaluate, appraise                                     | Assess workload   |
| <b>Balance</b>   | Weigh (a question, two arguments, etc., against each other)                          | Balance the workload with the traffic demand.   |
| <b>Discuss</b>   | Investigate by reasoning or argument   | Discuss the impact of regulation.   |
| <b>Evaluate</b>  | Ascertain amount of, find numerical expression for                                   | Evaluate the necessary information to be provided to pilots in need of navigational assistance. |
| <b>Interpret</b> | To decide on something's meaning or significance when there is a choice              | Interpret operational information.  |
| <b>Optimise</b>  | To make optimal; get the most out of; use best; modify to achieve maximum efficiency | Optimise the use of support tools.  |
| <b>Resolve</b>   | Solve, clear up, settle  | Resolve conflict  |
| <b>Select</b>    | Pick out as best or most suitable  | Select the runway in use  |
| <b>Theorise</b>  | Extract general principles from a particular experience                              | Theorise the resolution of conflict between a slow and a fast aircraft                          |

| L5 verb         | Definition   | Example   |
|-----------------|--|---|
| <b>Validate</b> | Make valid, ratify, prove valid, show or confirm the validity of something | Validate one radar vectoring option to expedite the traffic |

g. Application of taxonomy levels to practically-based objectives

- i. Objectives at taxonomy level 3 or higher, which are of a practical nature, related to all subjects except ATM, may be achieved by any suitable type of practical training methods e.g. hands on, plotting on charts, etc.
  - ii. Objectives at taxonomy level 3 or higher, for the ATM subject (Basic and Rating), are practical by nature and require the integration of several knowledge areas and skills at the same time, e.g. vectoring of an aircraft requires knowledge and skills in the areas of radio telephony, aircraft performance, navigation and radar theory. Therefore, ATM level 3 objectives should be achieved through the use of a part task trainer or a simulator.
  - iii. ATM level 4 objectives should be achieved for the most part through the use of a simulator. A part task trainer, which presents operational situations at an enforced pace, may be used to achieve some ATM level 4 objectives.
  - iv. ATM level 5 objectives should be achieved through the use of a simulator.
-

## Supplement 2

### Abbreviations

For the purposes of these AMCs, the following abbreviations and acronyms shall apply:

| Abbreviation | Meaning  |
|--------------|--|
| ABAS         | Aircraft-based Augmentation System (EGNOS)   |
| ACAS         | Airborne Collision Avoidance System  |
| ACC          | Area Control Centre  |
| ACP          | Area Control Procedural Rating   |
| ACFT         | Aircraft (subject)   |
| ACN          | Aircraft Classification Number   |
| ACS          | Area Control Surveillance Rating   |
| ADF          | Automatic Direction Finding System   |
| ADI          | Aerodrome Control Instrument   |
| ADS          | Automatic Dependent Surveillance   |
| ADV          | Aerodrome Control Visual Rating  |
| ADVS         | Advisory Service   |
| AEA          | Association of European Airlines   |
| AFIL         | Air Filed Flight Plan  |
| AFTN         | Aeronautical fixed telecommunication network   |
| AGA          | Aerodromes   |
| AIC          | Aeronautical Information Circular  |
| AIP          | Aeronautical Information Publication   |
| AIRAC        | Aeronautical Information Regulation and Control  |
| AIRAC SUP    | AIRAC Supplement   |
| AIREP        | Air-Report   |
| AIRMET       | Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations |
| AIS          | Aeronautical Information Service   |
| ALRS         | Alerting Service   |
| AMC          | Acceptable Means of Compliance   |
| APM          | Approach Path Monitor  |
| APP          | Approach Control / Centre / Procedural Rating  |
| APS          | Approach Control Surveillance Rating   |
| APV          | Approach Procedure with Vertical guidance  |
| APW          | Area Proximity Warning   |
| ASDA         | Accelerate Stop Distance Available   |
| ASM          | Airspace Management  |

|         |  |
|---------|--|
| ASMGCS  | Advanced Surface Movement Guidance and Control Systems               |
| ATC     | Air Traffic Control  |
| ATCEUC  | Air Traffic Controllers European Unions Co-ordination                |
| ATCO    | Air Traffic Controller   |
| ATCS    | Air Traffic Control Service  |
| ATFCM   | Air Traffic Flow and Capacity Management                             |
| ATFM    | Air Traffic Flow Management  |
| ATIS    | Automatic Terminal Information Service                               |
| ATM     | Air Traffic Management   |
| ATS     | Air Traffic Services   |
| ATZ     | Aerodrome Traffic Zone   |
| AVASI   | Advanced Visual Approach Slope Indicator                             |
| B-RNAV  | Basic Area Navigation  |
| BIRDTAM | Bird hazard NOTAM (NOTAM reporting bird hazard)                      |
| CANSO   | Civil Air Navigation Services Organisation                           |
| CAT     | Clear Air Turbulence   |
| CBA     | Cross Border Area  |
| CBT     | Computer Based Training  |
| CCIS    | Closed Circuit Information System                                    |
| CDR     | Conditional Route  |
| CISM    | Critical Incident Stress Management                                  |
| CPDLC   | Controller Pilot Data Link Communications                            |
| CPL     | Current Flight Plan  |
| D-GPS   | Differential Global Positioning System                               |
| DFTI    | Distance from Touchdown Indicator                                    |
| DME     | Distance Measuring Equipment   |
| Doc     | Document   |
| EAM     | ESARR Advisory Material  |
| EASA    | European Aviation Safety Agency                                      |
| EAT     | Expected Approach Time   |
| EATCHIP | European Air Traffic Control Harmonisation and Integration Programme |
| EATMP   | European Air Traffic Management Programme                            |
| EC      | European Commission  |
| ECAC    | European Civil Aviation Conference                                   |
| EET     | Estimated Elapsed Time   |
| EFIS    | Electronic Flight Instrument System                                  |
| EGNOS   | European Geostationary Overlay Service                               |
| EQPS    | Equipment and Systems (subject)                                      |

|             |  |
|-------------|--|
| ESARR       | Eurocontrol Safety Regulatory Requirements                       |
| ETF         | European Transport Workers' Federation                           |
| EUROCONTROL | European Organisation for the Safety of Air Navigation           |
| FAB         | Functional Airspace Block  |
| FDPS        | Flight Data Processing System                                    |
| FIR         | Flight Information Region  |
| FIS         | Flight Information Service                                       |
| FMS         | Flight Management System   |
| FPB         | Flight Progress Board  |
| FPL         | Flight Plan  |
| FUA         | Flexible Use of Airspace   |
| GAIN Report | Global Aviation Information Network Report                       |
| GBAS        | Ground Based Augmentation System                                 |
| GLONASS     | Global Orbiting Navigation Satellite System                      |
| GNSS        | Global Navigation Satellite System                               |
| GP          | Glide Path   |
| GPS         | Global Positioning System  |
| GPWS        | Ground Proximity Warning System                                  |
| GUI         | Guidelines   |
| HBK         | Handbook   |
| HF          | High Frequency   |
| HUM         | Human Factors (subject)  |
| IACA        | International Air Carrier Association                            |
| IAOPA       | International Council of Aircraft Owner and Pilot Associations   |
| IATA        | International Air Transport Association                          |
| ICAO        | International Civil Aviation Organisation                        |
| IFALPA      | International Federation of Airline Pilots Association           |
| IFATCA      | International Federation of Air Traffic Controllers Associations |
| IFPS        | Integrated Initial Flight Plan Processing System                 |
| IFR         | Instrument Flight Rules  |
| ILS         | Instrument Landing System  |
| IMC         | Instrument Meteorological Conditions                             |
| INS         | Inertial Navigation System                                       |
| INTR        | Introduction to the course (subject)                             |
| IRS         | Inertial Reference System  |
| IRVR        | Instrument Runway Visual Range                                   |
| ISA         | International Standard Atmosphere                                |
| ITU         | International Telecommunications Union                           |

|        |   |
|--------|---|
| LAW    | Aviation Law (subject)  |
| LDA    | Landing Distance Available  |
| LLZ    | Localizer   |
| LNAV   | Lateral Navigation  |
| LOA    | Letter of Agreement   |
| LPV    | Lateral Precision with Vertical guidance approach   |
| MET    | Meteorology   |
| METAR  | Meteorological Aviation Routine Weather Report  |
| MLS    | Microwave Landing System  |
| Mode A | SSR identification code   |
| Mode C | SSR Mode C (Pronounced: Mode Charlie)   |
| Mode S | Mode Select   |
| MONA   | Monitoring Aids   |
| MSAW   | Minimum Safe Altitude Warning   |
| MTCD   | Medium Term Conflict Detection  |
| MWO    | Meteorological Watch Office   |
| NAV    | Navigation (subject)  |
| NAVAID | Navigation(al) Aid  |
| NDB    | Non-Directional Beacon  |
| No.    | Number  |
| NOTAM  | Notice to Airmen  |
| OJT    | On the Job Training   |
| OLDI   | On-Line Data Interchange  |
| P-RNAV | Precision Area Navigation   |
| PANS   | Procedures for Air Navigation Services  |
| PAPI   | Precision Approach Path Indicator   |
| PAR    | Precision Approach Radar  |
| PBN    | Performance Based Navigation  |
| PCN    | Pavement Classification Number  |
| PEN    | Professional Environment (subject)  |
| PSR    | Primary Surveillance Radar  |
| PTP    | Part Time Practice  |
| QDM    | Magnetic Heading  |
| QDR    | Magnetic Bearing  |
| QFE    | Atmospheric pressure at aerodrome elevation   |
| QNH    | Atmospheric pressure at mean sea level  |
| QTF    | The position of the transmitting station according to the bearings taken by the D/F station |
| RAIM   | Receiver Autonomous Integrity Monitoring  |

|               |   |
|---------------|---|
| RCC           | Rescue Coordination Centre                                  |
| RDPS          | Radar Data Processing System                                |
| RNAV          | Area Navigation   |
| RNP           | Required Navigation Performance                             |
| RNP-RNAV      | Required Navigation Performance-Area Navigation             |
| ROC           | Rate of Climb   |
| RPL           | Stored Flight Plan  |
| RTF           | Radio Telephony   |
| RVR           | Runway Visual Range   |
| RVSM          | Reduced Vertical Separation Minimum                         |
| SADIS         | Satellite Distribution of World Area Forecast System        |
| SAR           | Search and Rescue   |
| SARPs         | Standards and Recommended Practices (ICAO)                  |
| SBAS          | Satellite Based Augmentation System                         |
| SELCAL        | Selective Calling   |
| SERA          | Standardised European Rules of the Air                      |
| SHELL (model) | Software, Hardware, Environment, Live ware, Live ware Model |
| SID           | Standard Instrument Departure (Route)                       |
| SIGMET        | Significant Meteorological Information                      |
| SMR           | Surface Movement Radar                                      |
| SNOWTAM       | NOTAM on SNOW conditions                                    |
| SPECI         | Aviation Selected Special Weather Report                    |
| SRC           | Safety Regulation Commission                                |
| SRU           | Safety Regulation Unit                                      |
| SSR           | Secondary Surveillance Radar                                |
| STCA          | Short Term Conflict Alert                                   |
| SVFR          | Special Visual Flight Rules Flight                          |
| TACAN         | UHF Tactical Air Navigation Aid                             |
| TAF           | Terminal Area (Aerodrome) Forecast                          |
| TCAC          | Tropical Cyclone Advisory Centre                            |
| TODA          | Take Off Distance Available                                 |
| TORA          | Take Off Run Available                                      |
| TRM           | Team Resource Management                                    |
| TSA           | Temporary Segregated Area                                   |
| TWR           | Tower Control Unit (Aerodrome Control Tower)                |
| UDES          | Unusual Degraded Emergency Situations                       |
| UDF           | Ultra High Frequency Direction Finder                       |
| UHF           | Ultra High Frequency  |

|        |  |
|--------|--|
| UTC    | Coordinated Universal Time               |
| VAAC   | Volcanic Ash Advisory Centre             |
| VASI   | Visual Approach Slope Indicator          |
| VDF    | Very High Frequency Direction Finder     |
| VFR    | Visual Flight Rules                      |
| VHF    | Very High Frequency                      |
| VMC    | Visual Meteorological Conditions         |
| VNAV   | Vertical Navigation                      |
| VOLMET | Routine Weather Reports Broadcast on VHF |
| VOR    | VHF Omni-directional Radio Range         |
| WAFC   | World Area Forecast Centre               |
| WAFS   | World Area Forecast System               |
| WGS-84 | World Geodetic System 84                 |



**ANNEX 1 - PART-ATCO**  
**SUBPART D - ATCO TRAINING**  
**Section 2 - Initial training requirements for Air Traffic Controllers**

**AMC1 to Appendix 6**  
**Approach Control Procedural Rating (APP)**

- A. General principles that apply to this AMC are contained in ~~the~~~~its~~ ~~enclosed~~ Supplement ~~1~~~~to~~~~AMC1~~.
- B. ATCO Rating training Approach Control Procedural Rating (APP) should contain the following ~~subject objectives~~ and training objectives that are associated with the subjects, ~~subject objectives~~, topics and subtopics contained in **Appendix 6 - Approach Control Procedural Rating (APP)**
- C. Subjects, ~~subject objectives~~, topics and subtopics from ~~the~~Appendix 6 are repeated in this AMC for the convenience of the reader and do not form a part of it.

## NPA -> CRD TRACK CHANGES FILE

This document has been provided to help reviewers make a comparison between the corresponding AMCs to appendices of the NPA 2012-18 (15 Nov 2012) and the CRD (30 Sep 2013) of Licensing and medical certification of air traffic controllers Implementing Rule - Part (B.V) ATCO Initial training requirements.

To decode the changes the following conventions have been used:

**Deleted** information is shown with the ~~strikethrough-effect~~

**Relocated** information is shown with the ~~strikethrough-effect~~

**New** information is shown in ~~blue text~~.

When an existing objective has been relocated (and consequently renumbered) the new number is shown in black to the left of the objective and the original number in red below the new one.

3.2.1 - current objective number (if not modified it is the same as in NPA 2012-18 (B.V)

3.3.3 - old objective number that may have an additional subject indication if moved from one subject to another or B(asic) and R(ating) if moved from one syllabus to another

1.5.3 - new objective number for relocated objectives at its original location that may have an additional indication of a new subject or B(asic) and R(ating) if moved from one syllabus to another

---

**TABLE OF CONTENTS**

|  |    |
|--|----|
| SUBJECT 1: INTRODUCTION TO THE COURSE-----   | 3  |
| SUBJECT 2: AVIATION LAW-----   | 5  |
| SUBJECT 3: AIR TRAFFIC MANAGEMENT-----   | 7  |
| SUBJECT 4: METEOROLOGY-----  | 16 |
| SUBJECT 5: NAVIGATION-----   | 17 |
| SUBJECT 6: AIRCRAFT-----   | 19 |
| SUBJECT 7: HUMAN FACTORS-----  | 22 |
| SUBJECT 8: EQUIPMENT AND SYSTEMS-----  | 28 |
| SUBJECT 9: PROFESSIONAL ENVIRONMENT-----   | 31 |
| SUBJECT 10: <del>UNUSUAL/DEGRADED</del> ABNORMAL AND EMERGENCY<br>SITUATIONS ----- | 33 |
| SUBJECT 11: AERODROMES -----   | 36 |
| Supplements -----  | 39 |

## Subject 1 : INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

### TOPIC INTR 1 COURSE MANAGEMENT

| Subtopic          | INTR 1.1  | Course introduction                       |  |     |
|-------------------|---|---|--|-----|
| APP<br>INTR 1.1.1 | Explain the aims and main objectives of the course.                 | 2   |  | ALL |
| Subtopic          | INTR 1.2  | Course administration                     |  |     |
| APP<br>INTR 1.2.1 | State course administration.  | 1   |  | ALL |
| Subtopic          | INTR 1.3  | Study material and training documentation |  |     |
| APP<br>INTR 1.3.1 | Use appropriate documentation and their sources for course studies. | 3   | Optional content: Training documentation, library, CBT library, Web, Learning Management Server        | ALL |
| APP<br>INTR 1.3.2 | Integrate appropriate information into course studies.              | 4   | Training documentation<br>Optional content: Training documentation, supplementary information, library | ALL |

### TOPIC INTR 2 INTRODUCTION TO THE ATC TRAINING COURSE

| Subtopic          | INTR 2.1  | Course content and organisation |  |     |
|-------------------|---|---------------------------------|--|-----|
| APP<br>INTR 2.1.1 | State the different training methods applied in the course. | 1                               | Theoretical training, practical training, self-study, types of training events                                   | ALL |
| APP<br>INTR 2.1.2 | State the subjects of the course and their purpose.         | 1                               |  | ALL |
| APP<br>INTR 2.1.3 | Describe the organisation of theoretical training.          | 2                               | Optional content: course programme   | ALL |
| APP<br>INTR 2.1.4 | Describe the organisation of practical training.            | 2                               | Optional content: PTP, Simulation, Briefing, Debriefing, course programme  | ALL |
| Subtopic          | INTR 2.2  | Training ethos                  |  |     |
| APP<br>INTR 2.2.1 | Recognise the feedback mechanisms available.                | 1                               | Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback | ALL |

---

| Subtopic INTR 2.3 Assessment process |                                  |   |     |
|--------------------------------------|----------------------------------|---|-----|
| APP                                  | Describe the assessment process. | 2 | ALL |
| INTR 2.3.1                           |                                  |   |     |

---

## Subject 2 : AVIATION LAW

The subject objective is:

Learners shall ~~not~~ know, understand and apply the Rules of the Air and the Regulations regarding reporting, airspace and ~~not~~ appreciate the Licensing and Competence principles.

### TOPIC LAW 1 ATCO LICENSING / CERTIFICATE OF COMPETENCE

| Subtopic                      | LAW 1.1   | Privileges and conditions |   |     |   |
|-------------------------------|---|---------------------------|---|-----|---|
| APP<br>LAW 1.1.1              | Appreciate the conditions which <del>must</del> <b>shall</b> be met <del>to for the</del> issue <del>an of</del> Approach Control Procedural rating | 3                         | Commission Regulation (EU) <b>on ATCO Licensing No xxx/yyyy</b> <del>805/2011</del> | APP | <i>Optional content: National documents</i> |
| APP<br>LAW 1.1.2<br>6.1.1 HUM | Explain how to maintain and update professional knowledge <b>and skills</b> to retain competence in the operational environment.                    | 2                         |   | ALL |   |
| APP<br>LAW 1.1.3<br>1.1.2     | Explain the conditions for suspension/revocation of ATCO licence.   | 2                         | Commission Regulation (EU) <b>on ATCO Licensing No xxx/yyyy</b> <del>805/2011</del> | ALL |   |

### TOPIC LAW 2 RULES AND REGULATIONS

| Subtopic         | LAW 2.1  | Reports  |  |     |  |
|------------------|--|----------|--|-----|--|
| APP<br>LAW 2.1.1 | List the standard forms for reports.   | 1        | Air traffic incident report  | ALL | <i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>                           |
| APP<br>LAW 2.1.2 | Describe the functions of, and processes for, reporting.   | 2        | Reporting culture, Air traffic incident report   | ALL | <i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>                  |
| APP<br>LAW 2.1.3 | Use forms for reporting.   | 3        | Air traffic incident reporting form(s)   | ALL | <i>Optional content: ICAO Doc 4444 Appendix 4, routine air reports, breach of regulations, watch/log book, records</i> |
| Subtopic         | LAW 2.2  | Airspace |  |     |  |
| APP<br>LAW 2.2.1 | Appreciate classes and structure of airspace and their relevance to Approach Control Procedural rating operations. | 3        |  | APP |  |
| APP<br>LAW 2.2.2 | Provide planning, coordination and control actions appropriate to the airspace classification and structure.       | 4        | <i>Optional content: ICAO Annex 2, ICAO Annex 11, International requirements, Civil requirements, Military requirements, Areas of responsibility, Sectorisation, National requirements</i> | ALL |  |

|   |  |   |  |     |
|---|--|---|--|-----|
| APP<br>LAW 2.2.3                                    | Appreciate responsibility for terrain clearance.   | 3 |  | ALL |
| <b>TOPIC LAW 3 ATC SAFETY MANAGEMENT</b>            |  |   |  |     |
| <b>Subtopic LAW 3.1 Experience-Feedback process</b> |  |   |  |     |
| APP<br>LAW 3.1.1<br>10.1.1 HUM                      | State the importance of the controllers contribution to the experience feedback process. | 1 | Optional content: voluntary reporting  | ALL |
| APP<br>LAW 3.1.2<br>10.1.2 HUM                      | Describe how reported occurrences are analysed.  | 2 | Optional content: ESARR 2, local procedures  | ALL |
| APP<br>LAW 3.1.3<br>10.1.3 HUM                      | Name the means used to disseminate recommendations.                                      | 1 | Optional content: Safety letters, safety boards web pages                          | ALL |
| APP<br>LAW 3.1.4<br>10.1.4 HUM                      | Appreciate Explain the 'Just Culture' concept.   | 3 | Benefits, prerequisites, constraints<br>Optional content: EAM 2 GUI 6, GAIN Report | ALL |
| <b>Subtopic LAW 3.2 Safety Investigation-Branch</b> |  |   |  |     |
| APP<br>LAW 3.2.1<br>10.2.1 HUM                      | Describe role and mission of Safety Investigation Branch in the improvement of safety.   | 2 |  | ALL |
| APP<br>LAW 3.2.2<br>10.2.2 HUM                      | Define working methods of Safety Investigation Branch.                                   | 1 |  | ALL |

### Subject 3 : AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

| TOPIC     | ATM 1   | PROVISION OF SERVICES                               | <del>AIR TRAFFIC SERVICES AND AIRSPACE MANAGEMENT</del>  |
|-----------|---|---|--|
| Subtopic  | ATM 1.1   | Air traffic control (ATC) service                   |  |
| APP       | Appreciate own area of responsibility.  | 3   | APP<br>ACP<br>APS<br>ACS   |
| ATM 1.1.1 |   |   |  |
| 1.1.2     |   |   |  |
| APP       | Provide <del>the appropriate ATC</del> approach control service.  | 4   | ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals   |
| ATM 1.1.2 |   |   | APP<br>APS   |
| 1.1.1     |   |   |  |
| Subtopic  | ATM 1.2   | Flight information service (FIS)                    |  |
| APP       | Provide FIS.  | 4   | ICAO Doc 4444  |
| ATM 1.2.1 |   |   | Optional content: national documents   |
| 1.2.2     |   |   |  |
| APP       | Issue <del>Relay</del> appropriate information concerning the location of <del>other</del> conflicting traffic. | 3   | ICAO Doc 4444, Traffic information, Essential traffic information  |
| ATM 1.2.2 |   |   | APP<br>ACP<br>APS<br>ACS   |
| 1.2.1     |   |   |  |
| APP       | Appreciate the use of ATIS for the provision of flight information service by approach controller.              | 3   | APP<br>APS   |
| ATM 1.2.3 |   |   |  |
| Subtopic  | ATM 1.3   | Alerting service (ALRS)                             |  |
| APP       | Provide ALRS.   | 4   | ICAO Doc 4444  |
| ATM 1.3.1 |   |   | Optional content: national documents   |
| APP       | Respond to distress and urgency messages and signals.   | 3   | ICAO Annex 10, ICAO Doc 4444,  |
| ATM 1.3.2 |   |   | Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations |
|           |   |   | ALL  |
| Subtopic  | ATM 1.4   | ATS System capacity and air traffic flow management |  |
| APP       | Appreciate principles of <del>ATFM</del> ATS system capacity and air traffic flow management.                   | 3   | Optional content: EUROCONTROL ATFCM Users Manual Working principles of ATFM, FABs, FUA, free flight, etc.        |
| ATM 1.4.1 |   |   | APP<br>ACP<br>APS<br>ACS   |
| APP       | Apply flow management procedures in the provision of ATC.   | 3   | Optional content: EUROCONTROL ATFCM Users Manual   |
| ATM 1.4.2 |   |   | APP<br>ACP<br>APS<br>ACS   |

|                  |   |   |   |                          |
|------------------|---|---|---|--------------------------|
| APP<br>ATM 1.4.3 | Organise traffic flows and patterns to take account of airspace boundaries.     | 4 | <i>Optional content: Civil and Military, Controlled, Uncontrolled, Advisory, Restricted, Danger, Prohibited, Special rules, Sector boundaries, National boundaries, FIR boundaries, Delegated airspace, Transfer of control, Transfer of communications, En-route, Off-route</i>  | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 1.4.4 | Organise traffic flows and patterns to take account of areas of responsibility. | 4 | <i>Optional content: EUROCONTROL ATFCM Users Manual</i>   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 1.4.5 | Inform supervisor of situation.   | 3 | <i>Optional content: Abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, , unusual meteorological conditions, relevant information like: reported ground-based incidents, forest fire, smoke, oil pollution</i> | APP<br>ACP<br>APS<br>ACS |

| Subtopic         | ATM 1.5                                     | Airspace management (ASM) |  |                          |
|------------------|---|---------------------------|--|--------------------------|
| APP<br>ATM 1.5.1 | Appreciate the principles and means of ASM. | 3                         | <i>Optional content: FABs, FUA, ICAO Doc 4444, EUROCONTROL ASM HBK - Airspace Management Handbook for the application of FUA, TSAs, CDRs, CBAs</i> | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 1.5.2 | Organise traffic to take account of ASM.    | 4                         | <i>Optional content: CDR, TSA, TRA, CBA, real-time activation, deactivation or reallocation of airspace</i>  | APP<br>ACP               |

## TOPIC ATM 2 COMMUNICATION

| Subtopic                                 | ATM 2.1  | Effective communication |   |     |
|--|--|-------------------------|---|-----|
| APP<br>ATM 2.1.1                         | Use approved phraseology.  | 3                       | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2</i> | ALL |
| APP<br>ATM 2.1.2                         | Ensure effective <del>Perform</del> communication.<br><del>effectively.</del>        | 4                       | Communication techniques, Readback/verification of readback   | ALL |
| APP<br>ATM <del>2.1.3</del><br>6.1.2 HUM | <del>Analyse examples of pilot and controller communication for effectiveness.</del> | 4                       |   | ALL |

## TOPIC ATM 3 ATC CLEARANCES AND ATC INSTRUCTIONS

| Subtopic         | ATM 3.1                           | ATC clearances |  |     |
|------------------|-----------------------------------|----------------|--|-----|
| APP<br>ATM 3.1.1 | Issue appropriate ATC clearances. | 3              | ICAO Doc 4444<br><i>Optional content: national documents</i> | ALL |



|  |  |   |  |     |
|--|--|---|--|-----|
| APP<br>ATM 3.1.2   | Integrate appropriate ATC clearances in control service.               | 4 |  | ALL |
| APP<br>ATM 3.1.3   | Ensure the agreed course of action is carried out.                     | 4 |  | ALL |
| <b>Subtopic ATM 3.2 ATC instructions</b>                   |  |   |  |     |
| APP<br>ATM 3.2.1   | Issue appropriate ATC instructions.                                    | 3 | ICAO Doc 4444<br><i>Optional content: national documents</i>   | ALL |
| APP<br>ATM 3.2.2   | Integrate appropriate ATC instructions in control service.             | 4 |  | ALL |
| APP<br>ATM 3.2.3   | Ensure the agreed course of action is carried out.                     | 4 |  | ALL |
| <b>TOPIC ATM 4 COORDINATION</b>                            |  |   |  |     |
| <b>Subtopic ATM 4.1 Necessity for coordination</b>         |  |   |  |     |
| APP<br>ATM 4.1.1   | Identify the need for coordination.                                    | 3 |  | ALL |
| <b>Subtopic ATM 4.2 Tools and methods for coordination</b> |  |   |  |     |
| APP<br>ATM 4.2.1   | Use the available tools for coordination.                              | 3 | <i>Optional content: Electronic transfer of flight data, Telephone, Interphone, Intercom, Direct speech, Radiotelephone (RTF), Local agreements, automated system coordination</i> | ALL |
| <b>Subtopic ATM 4.3 Coordination procedures</b>            |  |   |  |     |
| APP<br>ATM 4.3.1   | Initiate appropriate coordination.                                     | 3 | Delegation/transfer of responsibility for air-ground communications and separation, transfer of control, etc.<br>ICAO Doc 4444<br><i>Optional content: release point</i>           | ALL |
| APP<br>ATM 4.3.2   | Analyse effect of coordination requested by an adjacent position/unit. | 4 | <i>Optional content: Delegation/transfer of responsibility for air-ground communications and separation, release point, transfer of control, etc.</i>                              | ALL |
| APP<br>ATM 4.3.3   | Select, after negotiation, an appropriate course of action.            | 5 | <del>When additional traffic cannot be accepted by adjacent position/unit ;<br/>When additional traffic cannot be accepted by own position/unit, etc.</del>                        | ALL |

|                  |  |   |               |     |
|------------------|--|---|---------------|-----|
| APP<br>ATM 4.3.4 | Ensure the agreed course of action is carried out. | 4 |               | ALL |
| APP<br>ATM 4.3.5 | Coordinate in the provision of FIS.                | 4 | ICAO Doc 4444 | ALL |
| APP<br>ATM 4.3.6 | Coordinate in the provision of ALRS.               | 4 | ICAO Doc 4444 | ALL |

## TOPIC ATM 5 ALTIMETRY AND LEVEL ALLOCATION

| Subtopic         | ATM 5.1  | Altimetry         |  |            |
|------------------|--|-------------------|--|------------|
| APP<br>ATM 5.1.1 | Allocate levels <del>(height, altitude, flight level)</del> according to altimetry data.                                   | 4                 | ICAO Doc 8168, ICAO Doc 4444   | ALL        |
| APP<br>ATM 5.1.2 | Ensure separation according to altimetry data.   | 4                 | <i>Optional content: Transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries</i> | ALL        |
| Subtopic         | ATM 5.2  | Terrain clearance |  |            |
| APP<br>ATM 5.2.1 | Provide planning, coordination and control actions appropriate to the rules for minimum safe levels and terrain clearance. | 4                 | <i>Optional content: Terrain clearance dimensions, Minimum safe altitudes, Transition level, Minimum flight level, Minimum sector altitude</i>             | APP<br>ACP |

## TOPIC ATM 6 SEPARATIONS

| Subtopic         | ATM 6.1  | Vertical separation   |   |                          |
|------------------|--|-----------------------|---|--------------------------|
| APP<br>ATM 6.1.1 | Provide standard vertical separation.                        | 4                     | ICAO Doc 4444, ICAO Doc 7030, Level allocation, During climb/descent, Rate of climb/descent, <a href="#">holding pattern</a>                        | APP<br>APS               |
| APP<br>ATM 6.1.2 | Provide increased vertical separation.                       | 4                     | ICAO Doc 4444, ICAO Doc 7030<br><i>Optional content: Level allocation, During climb/descent, Rate of climb/descent</i>                              | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 6.1.3 | Appreciate the application of vertical emergency separation. | 3                     | ICAO Doc 4444, ICAO Doc 7030  | APP<br>ACP<br>APS<br>ACS |
| Subtopic         | ATM 6.2  | Horizontal separation |   |                          |
| APP<br>ATM 6.2.1 | Provide longitudinal separation.                             | 4                     | Based on time, Based on distance (DME and/or GNSS, RNAV); <del>Based on time and ATIS surveillance systems observation - European Region only</del> | APP                      |

|  |  |   |   |            |
|--|--|---|---|------------|
| APP<br>ATM 6.2.2                                 | Provide lateral separation.  | 4 | ICAO Doc 4444, ICAO Doc 7030, <a href="#">holding</a> | APP<br>ACP |
| APP<br>ATM 6.2.3                                 | Provide track separation.  | 4 |   | ACP<br>APP |
| APP<br>ATM 6.2.4                                 | Provide geographical separation.   | 4 | Visual, Using navigation aids, Area Navigation        | ACP<br>APP |
| <b>Subtopic ATM 6.3 Delegation of separation</b> |  |   |   |            |
| APP<br>ATM 6.3.1                                 | Delegate separation to pilots in the case of aircraft executing successive visual approaches.                                    | 4 |   | APP<br>APS |
| APP<br>ATM 6.3.2                                 | Appreciate the conditions which must be met when delegating separation to pilots to fly maintaining own separation while in VMC. | 3 | ICAO Doc 4444   | APP<br>APS |
| APP<br>ATM <del>6.3.3</del>                      | <del>Provide contingency separation in the event of a navigation aid failure.</del>  | 4 | <del>Vertical, Standard, Emergency</del>              | APP<br>ACP |

## TOPIC ATM 7 AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS

|  |  |   |   |                          |
|--|--|---|---|--------------------------|
| <b>Subtopic ATM 7.1 Airborne collision avoidance systems</b> |  |   |   |                          |
| APP<br>ATM 7.1.1<br><del>7.1.6 B</del>                       | Differentiate between ACAS advisory thresholds and <del>ATC</del> separation standards applicable in the approach control environment. | 2 | ICAO Doc 9863<br><i>Optional content: EUROCONTROL TCAS Web page</i>       | APP<br>APS               |
| APP<br>ATM <del>7.1.2</del><br><del>7.1.4 B</del>            | Describe the controller responsibility during and following an ACAS RA reported by pilot.  | 2 | ICAO Doc 4444   | ALL                      |
| APP<br>ATM 7.1.3<br><del>7.1.1</del>                         | Respond to pilot notification of actions based on airborne systems warnings.   | 3 | ACAS, TAWS<br><i>Optional content: GPWS<br/>EUROCONTROL TCAS Web page</i> | APP<br>ACP<br>APS<br>ACS |

## TOPIC ATM 8 DATA DISPLAY

|   |  |   |   |     |
|---|--|---|---|-----|
| <b>Subtopic ATM 8.1 Data management</b> |  |   |   |     |
| APP<br>ATM 8.1.1                        | Update the data display to accurately reflect the traffic situation. | 3 | <i>Optional content: Information displayed, strip marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs</i> | ALL |

|                             |   |   |  |     |
|-----------------------------|---|---|--|-----|
| APP<br>ATM 8.1.2            | Analyse pertinent data on data displays.            | 4 |  | ALL |
| APP<br>ATM 8.1.3            | Organise pertinent data on data displays.           | 4 |  | ALL |
| APP<br>ATM <del>8.1.4</del> | <del>Process pertinent data on data displays.</del> | 3 |  | ALL |
| APP<br>ATM 8.1.4<br>8.1.5   | Obtain flight plan information.                     | 3 | CPL, FPL, Supplementary information<br>Optional content: RPL, AFIL, etc. | ALL |
| APP<br>ATM 8.1.5<br>8.1.6   | Use flight plan information.                        | 3 |  | ALL |

## TOPIC ATM 9 OPERATIONAL ENVIRONMENT (SIMULATED)

| Subtopic         | ATM 9.1  | Integrity of the operational environment               |   |                          |
|------------------|--|--|---|--------------------------|
| APP<br>ATM 9.1.1 | Obtain information concerning the operational environment. | 3  | Optional content: Briefing, notices, local orders, verification of information                      | ALL                      |
| APP<br>ATM 9.1.2 | Ensure the integrity of the operational environment.       | 4  | Optional content: Integrity of displays, Verification of the information provided by displays, etc. | APP<br>ACP<br>APS<br>ACS |
| Subtopic         | ATM 9.2  | Verification of the currency of operational procedures |   |                          |
| APP<br>ATM 9.2.1 | Check all relevant documentation before managing traffic.  | 3  | Optional content: Briefing, LOAs, NOTAM, AICs   | ALL                      |
| APP<br>ATM 9.2.2 | Manage traffic in accordance with procedural changes.      | 4  |   | APP<br>ACP<br>APS<br>ACS |
| Subtopic         | ATM 9.3  | Handover-takeover                                      |   |                          |
| APP<br>ATM 9.3.1 | Transfer information to the relieving controller.          | 3  |   | ALL                      |
| APP<br>ATM 9.3.2 | Obtain information from the controller handing over.       | 3  |   | ALL                      |

## TOPIC ATM 10 PROVISION OF CONTROL SERVICE

| Subtopic | ATM 10.1 | Responsibility and processing of information |  |  |
|----------|----------|--|--|--|
|----------|----------|--|--|--|

|   |   |   |   |                          |
|---|---|---|---|--------------------------|
| APP<br>ATM 10.1.1                         | Describe the division of responsibility between air traffic control units.              | 2 | ICAO Doc 4444   | ALL                      |
| APP<br>ATM 10.1.2                         | Describe the responsibility in regard to military traffic.                              | 2 | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9554</i>                           | ALL                      |
| APP<br>ATM 10.1.3<br>10.1.9               | Describe the responsibility in regard to unmanned free balloons.                        | 2 | ICAO Doc 4444   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.1.4<br>10.1.3               | Obtain operational information.   | 3 | ICAO Doc 4444,<br>Local operation manuals   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.1.5<br>10.1.4               | Interpret operational information.  | 5 |   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.1.6<br>10.1.5               | Organise forwarding of operational information.   | 4 | <i>Optional content: including the use of backup procedures</i>                   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.1.7<br>10.1.6               | Integrate operational information into control decisions.                               | 4 |   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.1.7<br>10.3.6               | <del>Ensure an adequate priority of actions.</del>                                      | 4 | <del>Formal and situational requirements, workload</del>                          | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.1.8<br>3.6.1 ACFT           | Appreciate the influence of operational requirements.                                   | 3 | <i>Optional content: Military flying, Calibration flights, Aerial photography</i> | ALL                      |
| APP<br>ATM 10.1.8<br>10.4.2               | <del>Balance the workload with the traffic demand.</del>                                | 5 | <del>Optional content: in own sector, in adjacent sectors</del>                   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 10.2 Approach control</b> |   |   |   |                          |
| APP<br>ATM 10.2.1                         | Explain the responsibility for the provision of an approach procedural control service. | 2 | ICAO Doc 4444, ICAO Annex 11,<br>Local operation manuals                          | APP                      |

|   |   |   |   |                          |
|---|---|---|---|--------------------------|
| APP<br>ATM 10.2.2                                   | Provide planning, coordination and control actions appropriate to the VFR, SVFR and IFR in VMC and IMC. | 4 | ICAO Annex 2, ICAO Annex 11, ICAO Doc 4444  | APP                      |
| <b>Subtopic ATM 10.3 Traffic management process</b> |   |   |   |                          |
| APP<br>ATM 10.3.1                                   | Ensure that situational awareness is maintained.  | 4 | Information gathering, traffic projection   | APP<br>ACP               |
| APP<br>ATM 10.3.2                                   | Detect conflicts in time for appropriate resolution.  | 4 |   | ALL                      |
| APP<br>ATM 10.3.3                                   | Identify potential solutions to achieve a safe and effective traffic flow.                              | 3 |   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.3.4                                   | Evaluate possible outcomes of different planning and control actions.                                   | 5 |   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.3.5                                   | Select an appropriate plan in time to achieve safe and effective traffic flow.                          | 5 |   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.3.6<br>10.1.7                         | Ensure an adequate priority of actions.   | 4 | Formal and situational requirements, workload   | ALL                      |
| APP<br>ATM 10.3.7                                   | Execute selected plan in a timely manner.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.3.8                                   | Ensure a safe and efficient outcome is achieved.  | 4 | Traffic monitoring, adaptability and follow up  | ALL                      |
| <b>Subtopic ATM 10.4 Handling traffic</b>           |   |   |   |                          |
| APP<br>ATM 10.4.1                                   | Manage arrivals, departures and overflights.  | 4 |   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.4.2<br>10.1.8                         | Balance the workload <del>with the traffic demand</del> against personal capacity.                      | 5 | Optional content: <del>in own sector, in adjacent sectors</del> re-routing, re-planning, prioritising solutions, denying requests, delegating responsibility for separation | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 10.4.3                                   | Manage traffic on different types of approaches.  | 4 | precision, non-precision, visual  | APP<br>APS               |

|   |   |   |   |                          |
|---|---|---|---|--------------------------|
| APP<br>ATM 10.4.4   | Initiate missed approach.   | 3 | ICAO Doc 4444   | APP<br>APS               |
| APP<br>ATM 10.4.5   | Integrate aircraft on missed approach into the traffic situation.   | 4 |   | APP<br>APS               |
| <b>TOPIC    ATM 11 HOLDING</b>                                |   |   |   |                          |
| <b>Subtopic    ATM 11.1    General holding procedures</b>     |   |   |   |                          |
| APP<br>ATM 11.1.1   | Apply holding procedures.   | 3 | ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM 11.1.2   | Appreciate the factors affecting holding patterns. <del>effect of: wind, aircraft speed, rate of turn, height, aircraft type, aircraft performance.</del> | 3 | effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type                                 | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic    ATM 11.2    Vertical separation in holding</b> |   |   |   |                          |
| APP<br>ATM <del>11.2.1</del><br>6.1.1                         | <del>Provide vertical separation between aircraft in a holding pattern.</del>   | 4 |   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ATM <del>11.2.2</del><br>6.1.1                         | <del>Provide vertical separation between aircraft in a holding pattern and other aircraft.</del>  | 4 |   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic    ATM 11.2    Approaching aircraft</b>           |   |   |   |                          |
| APP<br>ATM 11.2.1<br>11.3.1                                   | Calculate Expected Approach Times (EATs) and Expected Onward Clearance times.   | 3 |   | APP<br>APS               |
| APP<br>ATM 11.2.2<br>11.3.2                                   | Organise the traffic landing sequence in a holding pattern.   | 4 | Optional content: company preference, aircraft performance, aircraft approach capability, ILS categories, flow control management | APP<br>APS               |

## Subject 4 : METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

### TOPIC MET 1 METEOROLOGICAL PHENOMENA

| Subtopic                             | MET 1.1   | Meteorological phenomena |  |                          |
|--------------------------------------|---|--------------------------|--|--------------------------|
| APP<br>MET 1.1.1                     | Appreciate the impact of adverse weather.   | 3                        | Thunderstorms, Icing, Clear Air Turbulence (CAT), Turbulence, Microburst, Wind shear, Severe mountain waves, Line squalls, Volcanic ash<br><i>Optional content: Volcanic ash</i> | APP<br>APS               |
| APP<br>MET 1.1.2                     | Integrate data about meteorological phenomena into provision of ATS.  | 4                        | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena<br/>Separation, holding, diversions, re-routings, etc.</i>        | ALL                      |
| APP<br>MET <del>1.1.3</del><br>1.1.2 | <del>Integrate data about meteorological phenomena into clearances, instructions and transmitted information.</del> | 4                        | <del>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</del>   | APP<br>ACP<br>APS<br>ACS |
| APP<br>MET 1.1.3<br>1.1.4            | Use techniques to avoid adverse weather when necessary/possible.  | 3                        | Rerouting, level change, etc.  | APP<br>ACP<br>APS<br>ACS |

### TOPIC MET 2 SOURCES OF METEOROLOGICAL DATA

| Subtopic         | MET 2.1                           | Sources of meteorological information |  |                          |
|------------------|-----------------------------------|---------------------------------------|--|--------------------------|
| APP<br>MET 2.1.1 | Obtain meteorological information | 3                                     | METAR, TAF, SIGMET, AIRMET<br><i>Optional content: AIREP/AIREP Special</i>   | APP<br>ACP<br>APS<br>ACS |
| APP<br>MET 2.1.2 | Relay meteorological information. | 3                                     | ICAO Doc 4444 <del>To: aircraft, MET office</del><br><i>Optional content: flight information centre, adjacent ATS unit</i> | APP<br>ACP<br>APS<br>ACS |



## Subject 5 : NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

### TOPIC NAV 1 MAPS AND AERONAUTICAL CHARTS

| Subtopic                  | NAV 1.1   | Maps and charts |   |                          |
|---------------------------|---|-----------------|---|--------------------------|
| APP<br>NAV 1.1.1          | Decode symbols and information displayed on aeronautical maps and charts. | 3               | Instrument approach charts, SID charts, aerodrome charts, visual approach charts<br><br><i>Optional content: Military maps and charts</i> | ADI<br>APP<br>APS        |
| APP<br>NAV 1.1.2<br>1.1.1 | Use relevant maps and charts.   | 3               |   | APP<br>ACP<br>APS<br>ACS |

### TOPIC NAV 2 INSTRUMENTAL NAVIGATION

| Subtopic         | NAV 2.1   | Navigational systems               |   |                          |  |
|------------------|---|------------------------------------|---|--------------------------|--|
| APP<br>NAV 2.1.1 | Manage traffic in case of change in the operational status of navigational systems.                           | 4                                  | Optional content: limitations, status of ground-based and satellite-based systems | APP<br>ACP<br>APS<br>ACS |  |
| APP<br>NAV 2.1.2 | Appreciate the effect of precision, limitations and change of the operational status of navigational systems. | 3                                  | Optional content: limitations, status, degraded procedures                        | ALL                      |  |
| Subtopic         | NAV 2.2   | Stabilised approach                |   |                          |  |
| APP<br>NAV 2.2.1 | Describe the concept of stabilised approach.  | 2                                  | ICAO Doc 8168, Regulation (EC) No 1899/2006<br><br>Optional content: SKYbrary     | ADV<br>ADI<br>APP<br>APS |  |
| APP<br>NAV 2.2.2 | Appreciate the effect of late change of runway-in-use or type of approach for landing aircraft.               | 3                                  |   | APP<br>APS               |  |
| APP<br>NAV 2.2.3 | Appreciate controller actions that may contribute to unstabilised approach.                                   | 3                                  | Delayed descent   | APP                      |  |
| Subtopic         | NAV 2.3   | Instrument departures and arrivals |   |                          |  |
| APP<br>NAV 2.3.1 | Characterise SIDs.  | 2                                  |   | ADI<br>APP<br>APS        |  |
| APP<br>NAV 2.3.2 | Describe the types and phases of instrument approach procedures.  | 2                                  |   | APP<br>APS               |  |

|   |  |   |   |                                 |
|---|--|---|---|---------------------------------|
| APP<br>NAV 2.3.3                                | Describe the relevant minima applicable for a precision/non-precision and visual approach.                               | 2 |   | ADI<br>APP<br>APS               |
| <b>Subtopic NAV 2.4 Navigational assistance</b> |  |   |   |                                 |
| APP<br>NAV 2.4.1<br>2.2.1                       | Evaluate the necessary information to be provided to pilots in need of navigational assistance.                          | 5 | <i>Optional content: Nearest most suitable aerodrome, Track, Heading, Distance, Aerodrome information, Any other navigational assistance relevant at the time</i> | APP<br>ACP<br>APS<br>ACS        |
| <b>Subtopic NAV 2.5 Satellite-based systems</b> |  |   |   |                                 |
| APP<br>NAV 2.5.1<br>2.3.1                       | State the different applications operations associated with of satellite-based systems relevant for approach operations. | 1 | <i>Optional content: NPA, APV-baro VNAV, APV, LPV, Precision approach, ICAO Doc 8168 Vol.2</i>  | APP<br>APS                      |
| <b>Subtopic NAV 2.6 PBN applications</b>        |  |   |   |                                 |
| APP<br>NAV 2.6.1                                | State the navigation applications used in approach and terminal environments.  | 1 | Approach-RNP APCH/ RNP AR APCH; Terminal-RNAV-1 (≈P-RNAV)<br><br><i>Optional content: A-RNP, EC PBN Implementing Rule, ICAO Doc 9613</i>                          | APP<br>APS                      |
| APP<br>NAV 2.6.2                                | Explain the principles and designation of navigation specifications in use.  | 2 | <i>Optional content: performance, functionality, sensors, aircrew and controller requirements</i>   | APP<br>ACP<br>APS<br>ACS        |
| APP<br>NAV 2.6.3                                | State future PBN developments.   | 1 | A-RNP, APV<br><br><i>Optional content: RNP 3D, RNP 4D</i>   | ADI<br>APP<br>ACP<br>APS<br>ACS |

**Subject 6 : AIRCRAFT**

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

**TOPIC ACFT 1 AIRCRAFT INSTRUMENTS**

| Subtopic                     | ACFT 1.1   | Aircraft instruments |   |                   |  |
|------------------------------|--|----------------------|---|-------------------|--|
| APP<br>ACFT 1.1.1            | Integrate <del>the information indication</del> from aircraft instruments provided by the pilot in the provision of ATS. | 4                    | <del>Optional content: TCAS, wind shear indicator, weather radar</del>    | ALL               |  |
| APP<br>ACFT 1.1.2            | Explain the operation of aircraft radio equipment.   | 2                    | Optional content: Radios (number of), emergency radios, <del>SELCAL</del> | ALL               |  |
| APP<br>ACFT 1.1.3            | <del>Explain the operation of on-board surveillance equipment.</del>   | 2                    | <del>Transponders: equipment Mode A, Mode C, Mode S</del>                 | ADV<br>APP<br>ACP |  |
| APP<br>ACFT <del>1.1.4</del> | <del>Explain the use and benefits of CPDLC.</del>  | 2                    |   | ALL               |  |

**TOPIC ACFT 2 AIRCRAFT CATEGORIES**

| Subtopic          | ACFT 2.1  | Wake turbulence categories              |               |                   |
|-------------------|---|---|---------------|-------------------|
| APP<br>ACFT 2.1.1 | Explain the wake turbulence effect and associated hazards to the succeeding aircraft.                     | 2                                       |               | ALL               |
| APP<br>ACFT 2.1.2 | Appreciate the techniques used to prevent hazards associated with wake turbulence on succeeding aircraft. | 3                                       |               | ALL               |
| Subtopic          | ACFT 2.2  | Application of ICAO approach categories |               |                   |
| APP<br>ACFT 2.2.1 | Describe the use of ICAO approach categories.   | 2                                       | ICAO Doc 8168 | ADI<br>APP<br>APS |
| APP<br>ACFT 2.2.2 | Appreciate the effect of ICAO approach categories on the traffic organisation.                            | 3                                       |               | ADI<br>APP<br>APS |

**TOPIC ACFT 3 FACTORS AFFECTING AIRCRAFT PERFORMANCE**

| Subtopic          | ACFT 3.1  | Climb factors |  |                          |  |
|-------------------|---|---------------|--|--------------------------|--|
| APP<br>ACFT 3.1.1 | Integrate the influence of factors affecting aircraft during climb. | 4             | Optional content: speed, mass, air density, cabin pressurisation, wind and temperature | APP<br>ACP<br>APS<br>ACS |  |

|   |  |   |  |                          |
|---|--|---|--|--------------------------|
| APP<br>ACFT 3.1.2   | Appreciate the influence of factors affecting aircraft on take-off.  | 3 | <i>Optional content: runway conditions, runway slope, aerodrome elevation, wind, temperature, aircraft configuration, airframe contamination and aircraft mass</i> | APP<br>APS               |
| <b>Subtopic ACFT 3.2 Cruise factors</b>                       |  |   |  |                          |
| APP<br>ACFT 3.2.1   | Integrate the influence of factors affecting aircraft during cruise.   | 4 | Level, cruising speed, wind, mass, cabin pressurisation  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ACFT 3.3 Descent and initial approach factors</b> |  |   |  |                          |
| APP<br>ACFT 3.3.1   | Integrate the influence of factors affecting aircraft during descent.  | 4 | <i>Optional content: wind, speed, rate of descent, aircraft configuration, cabin pressurisation</i>  | APP<br>APS               |
| <b>Subtopic ACFT 3.4 Final approach and landing factors</b>   |  |   |  |                          |
| APP<br>ACFT 3.4.1   | Integrate the influence of factors affecting aircraft during final approach and landing.   | 4 | <i>Optional content: wind, aircraft configuration, mass, meteorological conditions, runway conditions, runway slope, aerodrome elevation</i>                       | APP<br>APS               |
| <b>Subtopic ACFT 3.5 Economic factors</b>                     |  |   |  |                          |
| APP<br>ACFT 3.5.1   | Integrate consideration of economic factors affecting aircraft.  | 4 | <i>Optional content: Routing, Level, Speed, Rate of climb and Rate of descent, Approach profile</i>  | APP<br>APS               |
| APP<br>ACFT 3.5.2   | Use continuous climb techniques where applicable.  | 3 |  | APP<br>ACP<br>APS<br>ACS |
| APP<br>ACFT 3.5.3   | Use direct routing where applicable.   | 3 |  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ACFT 3.6 Miscellaneous Factors</b>                |  |   |  |                          |
| APP<br>ACFT 3.6.1<br>10.1.8 ATM                               | Appreciate the influence of operational requirements.  | 3 | <del><i>Optional content: Military flying, Calibration flights, Aerial photography, banner towing</i></del>  | APP<br>APS               |
| <b>Subtopic ACFT 3.6 Environmental factors</b>                |  |   |  |                          |
| APP<br>ACFT 3.6.1<br>3.7.1                                    | Appreciate the performance restrictions due to environmental constraints.<br><del>Estimate the influence of ecological factors affecting aircraft.</del> | 3 | <i>Optional content: Fuel dumping, Noise abatement procedures, Minimum flight levels, Bird hazard, Continuous Descent Operations Approach</i>                      | APP<br>APS               |
| <b>TOPIC ACFT 4 AIRCRAFT DATA</b>                             |  |   |  |                          |
| <b>Subtopic ACFT 4.1 Performance data</b>                     |  |   |  |                          |

|                                 |   |   |  |                          |
|---------------------------------|---|---|--|--------------------------|
| APP<br>ACFT 4.1.1               | Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/working environment into the provision of a control service. | 4 | Performance data under a representative variety of circumstances | APP<br>ACP<br>APS<br>ACS |
| APP<br>ACFT 4.1.2<br>1.1.2 ABES | <del>Identify potential or actual emergency situations.</del>   | 3 |  | APP<br>ACP<br>APS<br>ACS |

## Subject 7 : HUMAN FACTORS

The subject objective is:

Learners shall recognise the necessity to constantly extend their knowledge and analyse factors which affect personal and team performance.

### TOPIC HUM 1 PSYCHOLOGICAL FACTORS

| Subtopic         | HUM 1.1  | Cognitive |   |     |
|------------------|--|-----------|---|-----|
| APP<br>HUM 1.1.1 | Describe the human information processing model.                               | 2         | Attention, perception, memory, situational awareness, decision making, response                                   | ALL |
| APP<br>HUM 1.1.2 | Describe the factors which influence human information processing.             | 2         | Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations | ALL |
| APP<br>HUM 1.1.3 | Monitor the effect of human information processing factors on decision making. | 3         | Optional content: workload, stress, interpersonal relations, distraction, confidence                              | ALL |

### TOPIC HUM 2 MEDICAL AND PHYSIOLOGICAL FACTORS

| Subtopic         | HUM 2.1   | Fatigue |   |     |
|------------------|---|---------|---|-----|
| APP<br>HUM 2.1.1 | State factors that cause fatigue.   | 1       | Shift work<br><br>Optional content: night shifts and rosters  | ALL |
| APP<br>HUM 2.1.2 | Describe the onset of fatigue.  | 2       | Optional content: Lack of concentration, Listlessness, Irritability, Frustration, ICAO Circular 241 – AN/145 Human factors in Air Traffic Control | ALL |
| APP<br>HUM 2.1.3 | Recognise the onset of fatigue in self.                                   | 1       | Optional content: ICAO Circular 241 – AN/145 Human factors in Air Traffic Control   | ALL |
| APP<br>HUM 2.1.4 | Recognise the onset of fatigue in others.                                 | 1       |   | ALL |
| APP<br>HUM 2.1.5 | Describe <del>Consider</del> appropriate action when recognising fatigue. | 2       |   | ALL |
| Subtopic         | HUM 2.2   | Fitness |   |     |
| APP<br>HUM 2.2.1 | Recognise signs of lack of personal fitness.                              | 1       |   | ALL |

|  |   |   |  |     |
|--|---|---|--|-----|
| APP<br>HUM 2.2.2                                       | Describe actions when aware of a lack of personal fitness.  | 2 |  | ALL |
| <b>TOPIC HUM 3 SOCIAL AND ORGANISATIONAL FACTORS</b>   |   |   |  |     |
| <b>Subtopic HUM 3.1 Team resource management (TRM)</b> |   |   |  |     |
| APP<br>HUM 3.1.1                                       | State the <b>relevance objectives</b> of TRM.   | 1 | <i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>                                      | ALL |
| APP<br>HUM 3.1.2                                       | State the content of the TRM concept.   | 1 | <i>Optional content: team work, human error, team roles, stress, decision making, communication, situational awareness</i>           | ALL |
| <b>Subtopic HUM 3.2 Teamwork and team roles</b>        |   |   |  |     |
| APP<br>HUM 3.2.1                                       | Identify reasons for conflict.  | 3 |  | ALL |
| APP<br>HUM 3.2.2                                       | Describe actions to prevent human conflicts.  | 2 | <i>Optional content: TRM team roles</i>  | ALL |
| APP<br>HUM 3.2.3                                       | Describe strategies to cope with human conflicts.   | 2 | <i>Optional content: in your team, in the simulator</i>  | ALL |
| <b>Subtopic HUM 3.3 Responsible behaviour</b>          |   |   |  |     |
| APP<br>HUM 3.3.1                                       | Consider the factors which influence responsible behaviour.   | 2 | <i>Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality</i> | ALL |
| APP<br>HUM 3.3.2                                       | Apply responsible judgement.  | 3 | Case study and discussion about a dilemma situation  | ALL |
| <b>TOPIC HUM 4 STRESS</b>                              |   |   |  |     |
| <b>Subtopic HUM 4.1 Stress</b>                         |   |   |  |     |
| APP<br>HUM 4.1.1                                       | Recognise the effects of stress on performance.   | 1 | Stress and its symptoms in self and in others  | ALL |
| <b>Subtopic HUM 4.2 Stress management</b>              |   |   |  |     |
| APP<br>HUM 4.2.1                                       | Act to reduce stress.   | 3 | The effect of personality in coping with stress, The benefits of active stress management  | ALL |
| APP<br>HUM 4.2.2                                       | <b>Respond to stressful situation by offering, asking or accepting assistance. Obtain assistance in stressful situations.</b> | 3 | <i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i>                             | ALL |

|                  |  |   |  |     |
|------------------|--|---|--|-----|
| APP<br>HUM 4.2.3 | Recognise the effect of shocking and stressful events.               | 1 | Self and others, Abnormal situations, CISM         | ALL |
| APP<br>HUM 4.2.4 | Consider the benefits of Critical Incident Stress Management (CISM). | 2 |  | ALL |
| APP<br>HUM 4.2.5 | Explain procedures used following an incident/accident.              | 2 | Optional content: CISM, Counselling, Human element | ALL |

## TOPIC HUM 5 HUMAN ERROR

| Subtopic         | HUM 5.1 Human error  |   |  |     |
|------------------|--|---|--|-----|
| APP<br>HUM 5.1.1 | Explain the relationship between error and safety.                               | 2 | Number and combination of errors, proactive versus reactive approach to discovery of error<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |
| APP<br>HUM 5.1.2 | Differentiate between the types of error.  | 2 | Slips, Lapses, Mistakes<br><br><i>Optional content: <del>Slips, Lapses, Mistakes</del> ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>                                 | ALL |
| APP<br>HUM 5.1.3 | Describe error-prone conditions.   | 2 | <i>Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences</i>  | ALL |
| APP<br>HUM 5.1.4 | Collect examples of different error types, their causes and consequences in ATC. | 3 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| APP<br>HUM 5.1.5 | Explain how to detect errors to compensate for them.                             | 2 | STCA, MSAW, individual and collective strategy<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| APP<br>HUM 5.1.6 | Execute corrective actions.  | 3 | Error compensation<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| APP<br>HUM 5.1.7 | Explain the importance of error management.                                      | 2 | <i>Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practises</i>  | ALL |



|  |  |   |  |     |
|--|--|---|--|-----|
| APP<br>HUM 5.1.8   | Describe the impact on an ATCO following an occurrence/incident.   | 2 | <i>Optional content: reporting, SMS, investigation, CISM</i>   | ALL |
| <b>Subtopic HUM 5.2 Violation of rules</b>   |  |   |  |     |
| APP<br>HUM 5.2.1   | Explain the causes and dangers of violation of rules becoming accepted as a practice.  | 2 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>     | ALL |
| <b>TOPIC HUM 6 WORKING METHODS</b>   |  |   |  |     |
| <b>Subtopic HUM 6.1 Efficiency</b>   |  |   |  |     |
| APP<br>HUM 6.1.1   | <del>Consider, from a human factors point of view, the factors affecting efficiency in the provision of air traffic control.</del> | 2 | <del><i>Optional content: Own and others workload, OT, customer requirements, economy, ecology, safety</i></del> | ALL |
| <b>TOPIC HUM 6 COLLABORATIVE WORK</b>  |  |   |  |     |
| <b>Subtopic HUM 6.1 Communication</b>  |  |   |  |     |
| APP<br>HUM 6.1.1<br>8.1.1  | Use communication effectively in ATC.  | 3 |  | ALL |
| APP<br>HUM 6.1.2<br>2.1.3 ATM  | Analyse examples of pilot and controller communication for effectiveness.  | 4 |  | ALL |
| <b>Subtopic HUM 6.2 Collaborative work within the same area of responsibility</b>    |  |   |  |     |
| APP<br>HUM 6.2.1<br>8.2.1  | List communication means between controllers in charge of the same area of responsibility (sector or tower).                       | 1 | <i>Optional content: Electronic, written, verbal and non-verbal communication</i>                                | ALL |
| APP<br>HUM 6.2.2<br>8.2.2  | Explain consequences of the use of communication means on effectiveness.   | 2 | <i>Optional content: Strips legibility and encoding, labels designation, Feedback</i>                            | ALL |
| APP<br>HUM 6.2.3<br>8.2.3  | List possible actions to provide a safe position handover.   | 1 | <i>Optional content: rigour, preparation, overlap time</i>   | ALL |
| APP<br>HUM 6.2.4<br>8.2.4  | Explain consequences of a missed position handover process.  | 2 |  | ALL |
| <b>Subtopic HUM 6.3 Collaborative work between different areas of responsibility</b> |  |   |  |     |

|  |  |   |  |     |
|--|--|---|--|-----|
| APP<br>HUM 6.3.1<br>8.3.1                              | List factors and means for an effective coordination between sectors and/or tower positions.                   | 1 | <i>Optional content: Other sectors constraints, electronic coordination tools</i>                        | ALL |
| <b>Subtopic HUM 6.4 Controller / pilot cooperation</b> |  |   |  |     |
| APP<br>HUM 6.4.1<br>8.4.1                              | Describe parameters affecting controller/pilot cooperation.  | 2 | <i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>                  | ALL |
| <b>TOPIC HUM 7 WORKING KNOWLEDGE</b>                   |  |   |  |     |
| <b>Subtopic HUM 7.1 Controller knowledge</b>           |  |   |  |     |
| APP<br>HUM 7.1.1<br>1.1.2 LAW                          | Explain how to maintain and update professional knowledge to retain competence in the operational environment. | 2 | <i>Optional content: Briefing, LOAs, NOTAM, AICs, Reports of accident/incident, VOLMET, ATIS, SIGMET</i> | ALL |
| <b>TOPIC HUM 9 WORK ENVIRONMENT</b>                    |  |   |  |     |
| <b>Subtopic HUM 9.1 Ergonomics</b>                     |  |   |  |     |
| APP<br>HUM 9.1.1                                       | <del>Appreciate the impact of working position ergonomics on controller activity.</del>                        | 3 |  | ALL |
| <b>TOPIC HUM 10 ATC SAFETY MANAGEMENT</b>              |  |   |  |     |
| <b>Subtopic HUM 10.1 Experience feedback</b>           |  |   |  |     |
| APP<br>HUM 10.1.1<br>3.1.1 LAW                         | State the importance of the controllers contribution to the experience feedback process.                       | 1 | <i>Optional content: voluntary reporting</i>   | ALL |
| APP<br>HUM 10.1.2<br>3.1.2 LAW                         | Describe how reported occurrences are analysed.  | 2 | <i>Optional content: ESARR2, local procedures</i>  | ALL |
| APP<br>HUM 10.1.3<br>3.1.3 LAW                         | Name the means used to disseminate recommendations.  | 1 | <i>Optional content: Safety letters, safety boards web pages</i>   | ALL |
| APP<br>HUM 10.1.4<br>3.1.4 LAW                         | Explain the "Just Culture" concept.  | 2 | <i>benefits, prerequisites, constraints</i><br><i>Optional content: EAM 2 GUI 6, GAIN Report</i>         | ALL |
| <b>Subtopic HUM 10.2 Safety investigation branch</b>   |  |   |  |     |
| APP<br>HUM 10.2.1<br>3.2.1 LAW                         | Describe role and mission of Safety Investigation Branch in the improvement of safety.                         | 2 |  | ALL |

---

|            |   |   |     |
|------------|---|---|-----|
| APP        | <del>Define working methods of Safety</del> | 1 | ALL |
| HUM 10.2.2 | <del>Investigation Branch:</del>            |   |     |
| 3.2.2 LAW  |   |   |     |

---

## Subject 8 : EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall ~~+~~ integrate knowledge and understanding of the basic working principles of equipment and systems and ~~it~~ comply with the equipment and system degradation procedures in the provision of ATS.

### TOPIC EQPS 1 VOICE COMMUNICATIONS

| Subtopic          | EQPS 1.1   | Radio communications       |  |                          |
|-------------------|--|----------------------------|--|--------------------------|
| APP<br>EQPS 1.1.1 | Operate two-way communication equipment.                       | 3                          | Transmit/receive switches, Procedures<br><i>Optional content: Frequency selection, Standby equipment</i>                                       | ALL                      |
| APP<br>EQPS 1.1.2 | Identify indications of operational status of radio equipment. | 3                          | <i>Optional content: Indicator lights, Serviceability displays, Selector/frequency displays</i>  | ALL                      |
| APP<br>EQPS 1.1.3 | Consider radio range.  | 2                          | <i>Optional content: Transfer to another frequency, Apparent radio failure, Failure to establish radio contact, Frequency protection range</i> | APP<br>ACP<br>APS<br>ACS |
| Subtopic          | EQPS 1.2   | Other voice communications |  |                          |
| APP<br>EQPS 1.2.1 | Operate landline communications.                               | 3                          | <i>Optional content: telephone, interphone and intercom equipment</i>  | ALL                      |

### TOPIC EQPS 2 AUTOMATION IN ATS

| Subtopic          | EQPS 2.1   | Aeronautical fixed telecommunication network (AFTN) |  |            |
|-------------------|--|---|--|------------|
| APP<br>EQPS 2.1.1 | Decode AFTN messages.                                  | 3   | <i>Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.</i>                | ALL        |
| Subtopic          | EQPS 2.2   | Automatic data Interchange                          |  |            |
| APP<br>EQPS 2.2.1 | Use automatic data transfer equipment where available. | 3   | <i>Optional content: <del>Sequencing systems</del>, Automated information and coordination, OLDI</i> | APP<br>ACP |

### TOPIC EQPS 3 CONTROLLER WORKING POSITION

| Subtopic          | EQPS 3.1  | Operation and monitoring of equipment |   |     |
|-------------------|---|---------------------------------------|---|-----|
| APP<br>EQPS 3.1.1 | Monitor the technical integrity of the controller working position. | 3                                     | Notification procedures, Responsibilities   | ALL |
| APP<br>EQPS 3.1.2 | Operate the equipment of the controller working position.           | 3                                     | <i>Optional content: Situation displays, Flight progress board, Flight data display, Radio, Telephone, Maps and charts, Strip-printer, Clock, Information <del>systems</del> <del>monitors</del>, (CCIS), UDF/VDF</i> | ALL |

|   |  |   |   |                          |
|---|--|---|---|--------------------------|
| APP<br>EQPS 3.1.3   | Operate <del>at</del> available equipment in unusual/degraded/abnormal and emergency situations. | 3 |   | ALL                      |
| <b>Subtopic EQPS 3.2 Situation displays and information systems</b>   |  |   |   |                          |
| APP<br>EQPS 3.2.1   | Use situation displays.  | 3 |   | ALL                      |
| APP<br>EQPS 3.2.2   | Check availability of information material.  | 3 |   | ALL                      |
| APP<br>EQPS 3.2.3   | Obtain information from equipment.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic EQPS 3.3 Flight data systems</b>                          |  |   |   |                          |
| APP<br>EQPS 3.3.1   | Use the flight data information at controller working position.                                  | 3 |   | ALL                      |
| <b>TOPIC EQPS 4 FUTURE EQUIPMENT</b>                                  |  |   |   |                          |
| <b>Subtopic EQPS 4.1 New developments</b>                             |  |   |   |                          |
| APP<br>EQPS 4.1.1   | Recognise future developments.   | 1 | New advanced systems  | ALL                      |
| <b>TOPIC EQPS 5 EQUIPMENT AND SYSTEMS LIMITATIONS AND DEGRADATION</b> |  |   |   |                          |
| <b>Subtopic EQPS 5.1 Reaction to limitations</b>                      |  |   |   |                          |
| APP<br>EQPS 5.1.1   | Take account of the limitations of equipment and systems.  | 2 |   | ALL                      |
| APP<br>EQPS 5.1.2   | Respond to technical deficiencies of the operational position.                                   | 3 | Notification procedures, Responsibilities   | ALL                      |
| <b>Subtopic EQPS 5.2 Communication equipment degradation</b>          |  |   |   |                          |
| APP<br>EQPS 5.2.1   | Identify that communication equipment has degraded.  | 3 | Optional content: Ground-air and landline communications  | APP<br>ACP<br>APS<br>ACS |
| APP<br>EQPS 5.2.2   | Integrate contingency procedures in the event of communication equipment degradation.            | 3 | Procedures for total or partial degradation of ground-air and landline communications, Alternative methods of transferring data | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic EQPS 5.3 Navigational equipment degradation</b>           |  |   |   |                          |

|                   |  |   |  |                                 |
|-------------------|--|---|--|---------------------------------|
| APP<br>EQPS 5.3.1 | Identify when a navigational equipment failure will affect operational ability.        | 3 | <i>Optional content: VOR, Navigational aids</i>  | ALL                             |
| APP<br>EQPS 5.3.2 | Integrate contingency procedures in the event of a navigational equipment degradation. | 3 | <i>Optional content: Vertical separation, Information to aircraft, Navigational assistance, Seeking assistance from adjacent units</i> | ADI<br>APP<br>ACP<br>APS<br>ACS |

## Subject 9 : PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

### TOPIC PEN 1 FAMILIARISATION PROFESSIONAL ENVIRONMENT

#### Subtopic PEN 1.1 Study visit to approach control unit

|                  |  |   |   |            |
|------------------|--|---|---|------------|
| APP<br>PEN 1.1.1 | Appreciate the functions and provision of an operational approach control service. | 3 | study visit to an approach control unit | APP<br>APS |
|------------------|--|---|---|------------|

### TOPIC PEN 2 AIRSPACE USERS

#### Subtopic PEN 2.1 Contributors to civil ATS operations

|                           |   |   |   |            |
|---------------------------|---|---|---|------------|
| APP<br>PEN 2.1.1<br>1.1.1 | Characterise civil <del>and military</del> ATS activities in approach control unit. | 2 | Study visit to an approach control unit<br><br><i>Optional content: Familiarisation visits to e.g. TWR, APP, ACC, AIS, RCC, Air Defence Units</i> | APP<br>APS |
|---------------------------|---|---|---|------------|

|                           |   |   |  |     |
|---------------------------|---|---|--|-----|
| APP<br>PEN 2.1.2<br>1.1.2 | Characterise other parties interfacing with ATS operations. | 2 | <i>Optional content: familiarisation visits to engineering services, fire and emergency services, airline operations offices</i> | ALL |
|---------------------------|---|---|--|-----|

#### Subtopic PEN 2.2 Contributors to military ATS operations

|                           |  |   |   |     |
|---------------------------|--|---|---|-----|
| APP<br>PEN 2.2.1<br>1.1.1 | Characterise <del>civil and</del> military ATS activities. | 2 | <i>Optional content: Familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units</i> | ALL |
|---------------------------|--|---|---|-----|

### TOPIC PEN 3 CUSTOMER RELATIONS

#### Subtopic PEN 3.1 ~~Customer relations~~ Provision of services and user requirements

|                           |   |   |  |     |
|---------------------------|---|---|--|-----|
| APP<br>PEN 3.1.1<br>1.2.1 | Identify the role of ATC as a service provider. <del>and the requirements of the ATS users.</del> | 3 | <del>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</del> | ALL |
|---------------------------|---|---|--|-----|

|                           |                                    |   |  |     |
|---------------------------|------------------------------------|---|--|-----|
| APP<br>PEN 3.1.2<br>1.2.1 | Appreciate ATS users requirements. | 3 | <del>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</del> | ALL |
|---------------------------|------------------------------------|---|--|-----|

### TOPIC PEN 4 ENVIRONMENTAL PROTECTION

#### Subtopic PEN 4.1 Environmental protection

|                  |   |   |  |                          |
|------------------|---|---|--|--------------------------|
| APP<br>PEN 4.1.1 | Describe the environmental constraints on aerodrome operations. | 2 | <i>Optional content: ICAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions</i> | ADV<br>ADI<br>APP<br>APS |
|------------------|---|---|--|--------------------------|

|                           |   |   |   |                          |
|---------------------------|---|---|---|--------------------------|
| APP<br>PEN 4.1.2<br>1.3.1 | Explain the use of Collaborative Environmental Management (CEM) process at airports. <del>Describe processes used to ensure environmental protection.</del> | 2 | <del>Optional content: night curfews, relations with local community, relations with environmental associations, relevant administrations</del> | ADV<br>ADI<br>APP<br>APS |
| APP<br>PEN 4.1.3          | Appreciate the mitigation techniques used to minimise aviation's impact on the environment.   | 3 | Optional content: Continuous Descent Operations (CDO), Noise abatement procedures, Noise Preferential Routes, flight efficiency                 | APP<br>APS               |



## Subject 10: ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in ~~unusual, degraded~~ abnormal and emergency situations.

### TOPIC ABES 1 ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS (ABES)

| Subtopic                        | ABES 1.1   | Overview of <del>UNUSUAL/DEGRADED</del> ABES |   |                          |
|---------------------------------|--|--|---|--------------------------|
| APP<br>ABES 1.1.1               | List common <del>unusual/degraded</del> abnormal and emergency situations.   | 1  | Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, <del>GPWS</del> ground based safety nets alerts, airframe failure, unreliable instruments, runway incursion | ALL                      |
| APP<br>ABES 1.1.2<br>4.1.2 ACFT | Identify potential or actual abnormal and emergency situations.  | 3  |   | ALL                      |
| APP<br>ABES 1.1.3<br>1.1.2      | Take into account the procedures for given <del>unusual/degraded</del> abnormal and emergency situations.            | 2  | Optional content: ICAO Doc 4444   | APP<br>ACP<br>APS<br>ACS |
| APP<br>ABES 1.1.4<br>1.1.3      | Take into account that procedures don't exist for all <del>unusual/degraded</del> abnormal and emergency situations. | 2  | Optional content: real life examples  | ALL                      |
| APP<br>ABES 1.1.5<br>1.1.4      | Consider how the evolution of a situation may have an impact on safety.  | 2  | Optional content: Separation, Information, Coordination   | ALL                      |

### TOPIC ABES 2 SKILLS IMPROVEMENT

| Subtopic          | ABES 2.1   | Communication effectiveness  |   |     |
|-------------------|--|------------------------------|---|-----|
| APP<br>ABES 2.1.1 | Ensure effective communication in all circumstances including the case where standard phraseology is not applicable. | 4                            | Phraseology, Vocabulary, Readback, Silence instruction                        | ALL |
| APP<br>ABES 2.1.2 | Apply change of radiotelephony call sign.  | 3                            | ICAO Doc 4444   | ALL |
| Subtopic          | ABES 2.2   | Avoidance of mental overload |   |     |
| APP<br>ABES 2.2.1 | Describe actions to keep the control of the situation.   | 2                            | Optional content: sector splitting, holding, flow management, task delegation | ALL |
| APP<br>ABES 2.2.2 | Organise priority of actions.  | 4                            |   | ALL |

|  |  |   |  |     |
|--|--|---|--|-----|
| APP<br>ABES 2.2.3  | Ensure an effective circulation of information.  | 4 | <i>Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.</i>  | ALL |
| APP<br>ABES 2.2.4  | Consider asking for help.  | 2 |  | ALL |
| <b>Subtopic ABES 2.3 Air / ground cooperation</b>  |  |   |  |     |
| APP<br>ABES 2.3.1  | Collect appropriate information relevant for the situation.  | 3 |  | ALL |
| APP<br>ABES 2.3.2  | Assist the pilot.  | 3 | <b>Pilot workload</b><br><i>Optional content: Instructions, information, support, human factors, etc.</i>  | ALL |
| <b>TOPIC ABES 3 PROCEDURES FOR <del>UNUSUAL/DEGRADED</del>/ABNORMAL AND EMERGENCY SITUATIONS</b> |  |   |  |     |
| <b>Subtopic ABES 3.1 Application of procedures for <del>UNUSUAL/DEGRADED</del> ABES</b>          |  |   |  |     |
| APP<br>ABES 3.1.1  | Apply the procedures for given <del>unusual/degraded</del> /abnormal and emergency situations.         | 3 | <i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, <del>GPWS</del> ground based safety nets alerts, airframe failure</i> | ALL |
| <b>Subtopic ABES 3.2 Radio failure</b>   |  |   |  |     |
| APP<br>ABES 3.2.1  | Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure. | 2 | <b>ICAO Doc 7030</b><br><i>Optional content: military procedures</i>   | ALL |
| APP<br>ABES 3.2.2  | Apply the procedures to be followed when a pilot experiences complete or partial radio failure.        | 3 | <i>Optional content: Prolonged loss of communication</i>   | ALL |
| <b>Subtopic ABES 3.3 Unlawful interference and aircraft bomb threat</b>                          |  |   |  |     |
| APP<br>ABES 3.3.1  | Apply ATC procedures associated with unlawful interference and aircraft bomb threat.                   | 3 | <b>ICAO Doc 4444</b>   | ALL |
| <b>Subtopic ABES 3.4 Strayed or unidentified aircraft</b>  |  |   |  |     |
| APP<br>ABES 3.4.1  | Apply the procedures in the case of strayed aircraft.  | 3 | <b>ICAO Doc 4444</b><br><i>Optional content: Inside controlled airspace, Outside controlled airspace</i>   | ALL |

|                                     |  |   |  |                          |
|-------------------------------------|--|---|--|--------------------------|
| APP<br>ABES 3.4.2                   | Apply the procedures in the case of unidentified aircraft.       | 3 | ICAO Doc 4444  | ALL                      |
| <b>Subtopic ABES 3.5 Diversions</b> |  |   |  |                          |
| APP<br>ABES 3.5.1                   | Provide navigational assistance to diverting emergency aircraft. | 4 | Track/heading, Distance, Other navigational assistance<br><i>Optional content: Nearest most suitable aerodrome</i> | APP<br>ACP<br>APS<br>ACS |

## Subject 11: AERODROMES

The subject objective is:

Learners shall recognise and understand the design and layout of aerodromes.

### TOPIC AGA 1 AERODROME DATA, LAYOUT AND COORDINATION

| Subtopic                  | AGA 1.1  | Definitions  |  |                          |
|---------------------------|--|--------------|--|--------------------------|
| APP<br>AGA 1.1.1          | <del>Describe the general layout of an aerodrome with a single runway and multiple runways.</del>            | 2            | <del>ICAO Annex 14</del><br><i>Optional content: AIP</i>   | APP<br>APS<br>ADV<br>ADI |
| APP<br>AGA 1.1.1<br>1.1.2 | Define aerodrome data.   | 1            | ICAO Annex 14<br><i>Optional content: Aerodrome elevation, Reference point, Apron, Movement area, Manoeuvring area, Hot spot</i> | ADV<br>ADI<br>APP<br>APS |
| Subtopic                  | AGA 1.2  | Coordination |  |                          |
| APP<br>AGA 1.2.1          | Identify the information that has to be passed between Air Traffic Services (ATS) and the airport authority. | 3            | Airport conditions, Fire/rescue category, Condition of ground equipment and NAVAIDs, AIRAC, ICAO Annex 14                        | APP<br>APS<br>ADV<br>ADI |

### TOPIC AGA 2 MOVEMENT AREA

| Subtopic         | AGA 2.1   | Movement area    |   |                          |
|------------------|---|------------------|---|--------------------------|
| APP<br>AGA 2.1.1 | Describe movement area.   | 2                | ICAO Annex 14                                 | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.1.2 | Describe the marking of obstacles and unusable or unserviceable areas.                          | 2                | Flags, Signs on pavement, Lights              | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.1.3 | Identify the information on conditions of the movement area that have to be passed to aircraft. | 3                | Essential information on aerodrome conditions | ADV<br>ADI<br>APP<br>APS |
| Subtopic         | AGA 2.2   | Manoeuvring area |   |                          |
| APP<br>AGA 2.2.1 | Describe manoeuvring area.  | 2                | ICAO Annex 14                                 | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.2.2 | Describe taxiway.   | 2                |   | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.2.3 | Describe the daylight marking on taxiways.  | 2                |   | ADV<br>ADI<br>APP<br>APS |

|                                 |  |   |  |                          |
|---------------------------------|--|---|--|--------------------------|
| APP<br>AGA 2.2.4                | Describe taxiway lighting.                                       | 2 |  | ADV<br>ADI<br>APP<br>APS |
| <b>Subtopic AGA 2.3 Runways</b> |  |   |  |                          |
| APP<br>AGA 2.3.1                | Describe runway.   | 2 | Runway, Runway surface, Runway strip, Shoulder, Runway end safety areas, Clearways, Stopways   | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.2                | Describe instrument runway.                                      | 2 | ICAO Annex 14  | ADI<br>APP<br>APS        |
| APP<br>AGA 2.3.3                | Describe non-instrument runway.                                  | 2 | ICAO Annex 14  | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.4                | Explain declared distances.                                      | 2 | TORA, TODA, ASDA, LDA  | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.5                | Explain the differences between ACN and PCN.                     | 2 | Strength of pavements  | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.6                | Describe the daylight markings on runways.                       | 2 | <i>Optional content: Runway Designator, Centre line, Threshold, Aiming point, Fixed distance, Touchdown zone, Side strip, Colour</i> | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.7                | Describe runway lights.  | 2 | <i>Optional content: Colour, Centre line, Intensity, Edge, Touchdown zone, Threshold, Barettes</i>                                   | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.8                | Explain the functions of visual landing aids.                    | 2 | <i>Optional content: AVASI, VASI, PAPI</i>   | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.9                | Describe the approach lighting systems.                          | 2 | Centre line, cross bars, Stroboscopic lights, Colours, Intensity and brightness  | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.10               | Characterise the effect of water/ice on runways.                 | 2 |  | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.11               | Explain braking action.  | 2 | Braking action coefficient   | ADV<br>ADI<br>APP<br>APS |
| APP<br>AGA 2.3.12               | Explain the effect of runway visual range on aerodrome operation | 2 |  | ADV<br>ADI<br>APP<br>APS |

## TOPIC AGA 3 OBSTACLES

### Subtopic AGA 3.1 Obstacle-free airspace around aerodromes

|  |                |   |   |   |                          |
|--|----------------|---|---|---|--------------------------|
| APP  | AGA 3.1.1      | Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes. | 2 |   | ADV<br>ADI<br>APP<br>APS |
| <b>TOPIC AGA 4 MISCELLANEOUS EQUIPMENT</b> |                |   |   |   |                          |
| <b>Subtopic</b>                            | <b>AGA 4.1</b> | <b>Location</b>   |   |   |                          |
| APP  | AGA 4.1.1      | Explain the location of different aerodrome ground equipment.                                       | 2 | <i>Optional content: LLZ, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI</i> | ADV<br>ADI<br>APP<br>APS |

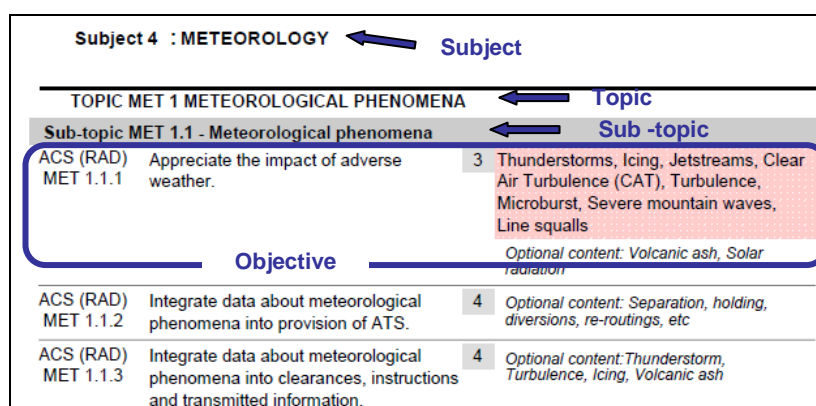
## Supplements

## Supplement 1

### SYLLABI STRUCTURE - HOW TO READ THE TABLES

#### 1. Structure of the Rating training syllabi

- a. Each Rating training has been structured as a syllabus, as follows:
  - i. Each syllabus is divided into subjects, which are divided into topics that are in turn divided into sub-topics. This structure is used to create and classify the objectives. There can be one or several objectives linked to each sub-topic.
  - ii. Objectives are assigned to a specific subject which deals with the knowledge and skills needed to accomplish the subject objective contained in Appendix 6 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(iii) Approach Control Procedural Rating — APP)



**Figure 1: Layout of syllabus**

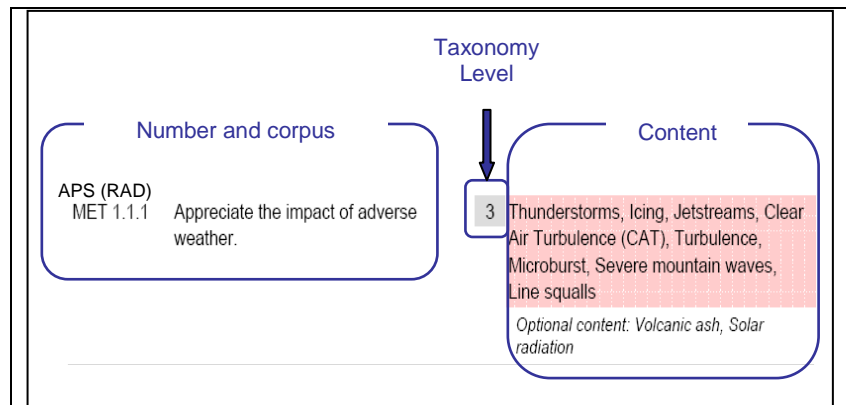
- b. The following principles may be applied to the development of a training course that is based on any of the syllabi:
  - i. The structure of the syllabi and the order of the objectives contained within Appendix 6 to Regulation (EU) No .../... is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.
  - ii. No objective from the Basic syllabus is repeated as 'a refresher' in the Rating syllabi.
  - iii. The number of objectives contained within a sub-topic does not necessarily signify how long it should take to teach that sub-topic. For example, a sub-topic containing five relatively straightforward objectives, may take a shorter time to be taught than another sub-topic containing two complex objectives.

#### 2. Structure of objectives

- a. An objective consists of three elements:
  - i. The corpus, which is a description of the required performance. It always contains an action verb to ensure that the outcome is observable. The action verb is always associated with a defined taxonomy.



- ii. The level, which indicates numerically the taxonomy of the action verb.
- iii. The content, which may be implicit or explicit. The explicit content is written in the content field, while the implicit content is not but, instead, is implied in the corpus of the objective and other elements (syllabus, subject, etc.). Content that is a required part of the objective is written in the red shaded field. Optional content, written in *italics*, may be used if considered appropriate.



**Figure 2: Layout of an objective**

### 3. Repeated and common objectives

- a. Repeated and common objectives are only applicable to Rating training.
- b. To the right of each objective there is an indication of which other ratings contain this particular objective. This indication is the first step to help the training providers in identifying the potential commonalities between the various syllabi. As a second step, the training provider must determine, at the level of local implementation, whether the objective is to be regarded as repeated or common.

| TOPIC MET 1 - METEOROLOGICAL PHENOMENA      |  |   |   |                          |
|---|--|---|---|--------------------------|
| Subtopic MET 1.1 - Meteorological phenomena |  |   |   |                          |
| APS<br>MET 1.1.1                            | Appreciate the impact of adverse weather.                            | 3 | Thunderstorms, Icing, Clear Air Turbulence (CAT), Turbulence, Microburst, Wind shear, Severe mountain waves, Line squalls, Volcanic ash | APP<br>APS               |
| APS<br>MET 1.1.2                            | Integrate data about meteorological phenomena into provision of ATS. | 4 | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena</i>                      | ALL                      |
| APS<br>MET 1.1.3                            | Use techniques to avoid adverse weather when necessary/possible.     | 3 | Rerouting, level change, etc.   | APP<br>ACP<br>APS<br>ACS |

**Figure 3: Indication of the ratings that particular objective applies to.**

### 3.1 Repeated objectives

- a. All the objectives appearing in a syllabus are implicitly appropriate to this syllabus. As a consequence, objectives may be repeated 'verbatim' in different rating syllabi and nevertheless specify a different performance. The reader always needs to mentally add the sentence 'in this syllabus context' at the end of each objective.

*For example, the objective 'use approved phraseology' is repeated (same level, same corpus, same content) in all the syllabi but is different because the context is different in each syllabus (a learner able to use approved phraseology for en-route traffic will need additional training before mastering the phraseology in the provision of aerodrome control).*

### 3.2 Common objectives

- a. Common objectives are verbatim the same objectives that appear in more than one rating syllabi in the same context so that they do not need to be taught again in case of combined or successively organised courses.

*For example, the objective 'describe the human information processing model' is common for all the syllabi because the context is non-specific and is therefore not determined by the type of rating.*

- b. As a general principle, the rating subject Human Factors is identical in each Rating training syllabi and can be considered as containing common objectives because the context is always the same. This means that the rating training objectives relating to Human Factors need only be taught once. If a learner is acquiring an additional rating, he/she would not be required to repeat the Human Factors objectives.

4. **Action verbs that support the Taxonomy for training objectives:**

a. The five taxonomy levels should be understood to have the following levels of complexity:

b. Action verbs for Level 1

Level 1 - A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

| <b>L1 Verb</b>   | <b>Definition</b>  | <b>Example</b>   |
|------------------|--|--|
| <b>Define</b>    | State what it is and what its limits are; state the definition | Define ATC service   |
| <b>Draw</b>      | Produce a picture, pattern or diagram                          | Draw the block diagram<br>Draw a holding pattern   |
| <b>List</b>      | Say one after the other  | List the main structure components of an aircraft  |
| <b>Name</b>      | Give name of objects or procedures                             | Name the components of an ILS<br>Name the key national and international aviation organisations. |
| <b>Quote</b>     | Repeat of what is written or said to underline                 | Quote ICAO definition of ATC service   |
| <b>Recognise</b> | To know what it is because you've seen it before               | Recognise the information contained in the different parts of the AIP.                           |
| <b>State</b>     | Say or write in a formal or definite way                       | State the meteorological hazards to aviation.  |

c. Action verbs for Level 2

Level 2 - The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

| <b>L2 Verb</b>      | <b>Definition</b>   | <b>Example</b>  |
|---------------------|---|---|
| <b>Characterise</b> | To describe the quality of features in something                                  | Characterise the main items of ATC equipment                            |
| <b>Consider</b>     | To think carefully about it   | Consider the benefits of Critical Incident Stress Management (CISM).    |
| <b>Demonstrate</b>  | Describe and explain; logically or mathematically proves the truth of a statement | Demonstrate the importance of good communications in ATC.               |
| <b>Describe</b>     | Say what it is like or what happened  | Describe the methods by which ICAO notifies and implements legislation. |

|                        |   |  |
|------------------------|---|--|
| <b>Differentiate</b>   | Show the differences between things                                   | Differentiate between different types of visibility.   |
| <b>Explain</b>         | Give details about something or describe so that it can be understood | Explain the purpose and function of ICAO   |
| <b>Take account of</b> | Take into consideration before deciding                               | Take into account the wind influence when calculating a ground speed.<br>Take account of the limitations of equipment and systems. |

## d. Action verbs for Level 3

Level 3 - A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

| <b>L3 Verb</b>    | <b>Definition</b>   | <b>Example</b>   |
|-------------------|---|--|
| <b>Act</b>        | Carry out, execute  | Act to reduce stress.  |
| <b>Apply</b>      | Use something in a situation or activity  | Apply separation.  |
| <b>Appreciate</b> | To understand a situation and know what is involved in a problem-solving situation, to state a plan without applying it                                 | Appreciate the necessity for coordination. (The learner says that the coordination will be done and with whom, he/she does not perform the actual coordination). |
| <b>Assist</b>     | Help somebody to do a job by doing part of it   | Assist the pilot   |
| <b>Calculate</b>  | To discover from information you already have by arithmetic; to think about a possible cause of action in order to form an opinion or decide what to do | Calculate appropriate levels<br>Calculate conversions between the three north designations.  |
| <b>Check</b>      | Make sure the information is correct (satisfactory)   | Check the accuracy of flight data information<br>Check availability of information material.   |
| <b>Choose</b>     | Select out of number, decide to do one thing rather than another  | Choose appropriate levels.<br>Choose which aircraft should be vectored   |
| <b>Collect</b>    | Assemble, accumulate, bring or come together  | Collect examples of different types of error, their causes and consequences in ATC.  |
| <b>Conduct</b>    | Lead, guide   | Conduct coordination   |
| <b>Confirm</b>    | Establish more firmly, corroborate  | Confirm sequence order   |
| <b>Decode</b>     | Turn into ordinary writing, decipher  | Decode the content of weather reports and forecast   |
| <b>Encode</b>     | Put into code or cipher   | Encode and decode flight plans (including supplementary information).  |
| <b>Estimate</b>   | Form an approximate judgement of a number, form an opinion  | Estimate distance and direction between two points   |
| <b>Execute</b>    | Perform action  | Execute corrective actions.  |
| <b>Extract</b>    | Copy out, make extracts from, find, deduce  | Extract pertinent data from relevant sources to produce a flight progress  |

| L3 Verb         | Definition  | Example   |
|-----------------|---|---|
|                 |   | display.  |
| <b>Identify</b> | Associate oneself inseparably with, establish the identity  | Identify the role of ATC as a service provider and the requirements of the ATS users.<br>Identify an aircraft |
| <b>Inform</b>   | Inspire, tell   | Inform supervisor of situation.   |
| <b>Initiate</b> | Begin, set going, originate   | Initiate appropriate coordination   |
| <b>Input</b>    | Enter in the system   | Input data  |
| <b>Issue</b>    | Send forth, publish   | Issue appropriate ATC clearances.<br>Issue appropriate traffic information.                                   |
| <b>Maintain</b> | Carry on, keep up, refresh  | Maintain flight data display  |
| <b>Measure</b>  | Ascertain extent or quality of (thing) by comparison with fixed unit or with object of known size | Measure distance on a map   |
| <b>Monitor</b>  | Keep under observation  | Monitor traffic<br>Monitor the effect of human information processing factors on decision making.             |
| <b>Notify</b>   | Make known, announce, report  | Notify runway in use  |
| <b>Obtain</b>   | Acquire easily, without research  | Obtain meteorological information<br>Obtain information from the relieving controller.                        |
| <b>Operate</b>  | Conduct work on equipment   | Operate the equipment of the controller working position.   |
| <b>Pass</b>     | Move, cause to go, transmit   | Pass essential traffic information without delay  |
| <b>Perform</b>  | Carry into effect, go through, execute  | Perform communication effectively   |
| <b>Process</b>  | To put through the steps of a prescribed procedure  | Process pertinent data on data displays.  |
| <b>Record</b>   | Register, set down for remembrance or reference   | Record information by writing effectively   |
| <b>Relay</b>    | Arrange in, provide with, replace by ...  | Relay meteorological information from pilot reports.  |
| <b>Respond</b>  | Make answer, perform answering or corresponding action  | Respond to loss/doubt concerning identification.<br>Respond to distress and urgency messages and signals.     |
| <b>Scan</b>     | Continuously observe rapidly, sequentially and  | Scan data display   |

| L3 Verb         | Definition   | Example  |
|-----------------|--|--|
|                 | selectively in order to extract relevant data                  |  |
| <b>Transfer</b> | Hand over  | Transfer information to the relieving controller                       |
| <b>Update</b>   | Refresh, bring up-to-date                                      | Update the data display to accurately reflect the traffic situation.   |
| <b>Use</b>      | Employ for a purpose, handle as instrument, put into operation | Use approved phraseology.<br>Use the available means for coordination. |
| <b>Verify</b>   | Establish truth of   | Verify the mode C information  |

## e. Action verbs for Level 4

Level 4 - Ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problem situation. This involves the integration of known applications in a familiar situation.

| L4 Verb           | Definition   | Example   |
|-------------------|--|---|
| <b>Acquire</b>    | Gain by oneself and for oneself, obtain after research | Acquire relevant aeronautical information   |
| <b>Adjust</b>     | Change to a new position, value or setting             | Adjust the surveillance system display  |
| <b>Allocate</b>   | Assign, devote   | Allocate levels (height, altitude, flight level) according to altimetry data.   |
| <b>Analyse</b>    | Examine minutely the constitution of                   | Analyse examples of pilot and controller communication for effectiveness.<br>Analyse the information provided by the radar equipment. |
| <b>Assign</b>     | Allot as a share, make over                            | Assign codes.   |
| <b>Coordinate</b> | Bring part into proper relation                        | Coordinate runway in use.<br>Coordinate in the provision of FIS.  |
| <b>Comply</b>     | Act in accordance with                                 | Comply with rules   |
| <b>Delegate</b>   | Commit authority to somebody                           | Delegate separation to pilots in the case of aircraft executing successive visual approaches.   |
| <b>Detect</b>     | Discover existence of                                  | Detect potential conflict   |
| <b>Ensure</b>     | Make safe, make certain                                | Ensure the agreed course of action is carried out   |
| <b>Expedite</b>   | Assist the progress of, do speedily                    | Expedite traffic  |

| L4 Verb          | Definition  | Example  |
|------------------|---|--|
| <b>Integrate</b> | Combine into a whole, complete by addition of parts         | Integrate appropriate ATC clearances in control service.   |
| <b>Manage</b>    | Handle, wield, conduct                                      | Manage traffic on the manoeuvring area.<br>Manage traffic in accordance with procedural changes. |
| <b>Organise</b>  | Give orderly structure to, frame and put into working order | Organise pertinent data on data displays.<br>Organise priority of actions.                       |
| <b>Predict</b>   | Forecast  | Predict positions of aircraft in the aerodrome traffic and taxi circuits.                        |
| <b>Provide</b>   | Supply, furnish   | Provide radar separation.<br>Provide FIS.  |
| <b>Relate</b>    | Establish link with   | Relate a pressure setting to an altitude   |

## f. Action verbs for Level 5

Level 5 - Ability to analyse new situation in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different from those previously met, requiring judgement and evaluation of options.

| L5 verb          | Definition   | Example   |
|------------------|--|---|
| <b>Assess</b>    | Estimate value or difficulty, evaluate, appraise                                     | Assess workload   |
| <b>Balance</b>   | Weigh (a question, two arguments, etc., against each other)                          | Balance the workload with the traffic demand.   |
| <b>Discuss</b>   | Investigate by reasoning or argument   | Discuss the impact of regulation.   |
| <b>Evaluate</b>  | Ascertain amount of, find numerical expression for                                   | Evaluate the necessary information to be provided to pilots in need of navigational assistance. |
| <b>Interpret</b> | To decide on something's meaning or significance when there is a choice              | Interpret operational information.  |
| <b>Optimise</b>  | To make optimal; get the most out of; use best; modify to achieve maximum efficiency | Optimise the use of support tools.  |
| <b>Resolve</b>   | Solve, clear up, settle  | Resolve conflict  |
| <b>Select</b>    | Pick out as best or most suitable  | Select the runway in use  |



| L5 verb         | Definition   | Example  |
|-----------------|--|--|
| <b>Theorise</b> | Extract general principles from a particular experience                    | Theorise the resolution of conflict between a slow and a fast aircraft |
| <b>Validate</b> | Make valid, ratify, prove valid, show or confirm the validity of something | Validate one radar vectoring option to expedite the traffic            |

g. Application of taxonomy levels to practically-based objectives

- i. Objectives at taxonomy level 3 or higher, which are of a practical nature, related to all subjects except ATM, may be achieved by any suitable type of practical training methods e.g. hands on, plotting on charts, etc.
- ii. Objectives at taxonomy level 3 or higher, for the ATM subject (Basic and Rating), are practical by nature and require the integration of several knowledge areas and skills at the same time, e.g. vectoring of an aircraft requires knowledge and skills in the areas of radio telephony, aircraft performance, navigation and radar theory. Therefore, ATM level 3 objectives should be achieved through the use of a part task trainer or a simulator.
- iii. ATM level 4 objectives should be achieved for the most part through the use of a simulator. A part task trainer, which presents operational situations at an enforced pace, may be used to achieve some ATM level 4 objectives.
- iv. ATM level 5 objectives should be achieved through the use of a simulator.

-----

## Supplement 2

### Abbreviations

For the purposes of these AMCs, the following abbreviations and acronyms shall apply:

| Abbreviation | Meaning  |
|--------------|--|
| ABAS         | Aircraft-based Augmentation System (EGNOS)   |
| ACAS         | Airborne Collision Avoidance System  |
| ACC          | Area Control Centre  |
| ACP          | Area Control Procedural Rating   |
| ACFT         | Aircraft (subject)   |
| ACN          | Aircraft Classification Number   |
| ACS          | Area Control Surveillance Rating   |
| ADF          | Automatic Direction Finding System   |
| ADI          | Aerodrome Control Instrument   |
| ADS          | Automatic Dependent Surveillance   |
| ADV          | Aerodrome Control Visual Rating  |
| ADVS         | Advisory Service   |
| AEA          | Association of European Airlines   |
| AFIL         | Air Filed Flight Plan  |
| AFTN         | Aeronautical fixed telecommunication network   |
| AGA          | Aerodromes   |
| AIC          | Aeronautical Information Circular  |
| AIP          | Aeronautical Information Publication   |
| AIRAC        | Aeronautical Information Regulation and Control  |
| AIRAC SUP    | AIRAC Supplement   |
| AIREP        | Air-Report   |
| AIRMET       | Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations |
| AIS          | Aeronautical Information Service   |
| ALRS         | Alerting Service   |
| AMC          | Acceptable Means of Compliance   |
| APM          | Approach Path Monitor  |
| APP          | Approach Control / Centre / Procedural Rating  |
| APS          | Approach Control Surveillance Rating   |
| APV          | Approach Procedure with Vertical guidance  |
| APW          | Area Proximity Warning   |
| ASDA         | Accelerate Stop Distance Available   |

|         |  |
|---------|--|
| ASM     | Airspace Management  |
| ASMGCS  | Advanced Surface Movement Guidance and Control Systems               |
| ATC     | Air Traffic Control  |
| ATCEUC  | Air Traffic Controllers European Unions Co-ordination                |
| ATCO    | Air Traffic Controller   |
| ATCS    | Air Traffic Control Service  |
| ATFCM   | Air Traffic Flow and Capacity Management                             |
| ATFM    | Air Traffic Flow Management  |
| ATIS    | Automatic Terminal Information Service                               |
| ATM     | Air Traffic Management   |
| ATS     | Air Traffic Services   |
| ATZ     | Aerodrome Traffic Zone   |
| AVASI   | Advanced Visual Approach Slope Indicator                             |
| B-RNAV  | Basic Area Navigation  |
| BIRDTAM | Bird hazard NOTAM (NOTAM reporting bird hazard)                      |
| CANSO   | Civil Air Navigation Services Organisation                           |
| CAT     | Clear Air Turbulence   |
| CBA     | Cross Border Area  |
| CBT     | Computer Based Training  |
| CCIS    | Closed Circuit Information System                                    |
| CDR     | Conditional Route  |
| CISM    | Critical Incident Stress Management                                  |
| CPDLC   | Controller Pilot Data Link Communications                            |
| CPL     | Current Flight Plan  |
| D-GPS   | Differential Global Positioning System                               |
| DFTI    | Distance from Touchdown Indicator                                    |
| DME     | Distance Measuring Equipment   |
| Doc     | Document   |
| EAM     | ESARR Advisory Material  |
| EASA    | European Aviation Safety Agency                                      |
| EAT     | Expected Approach Time   |
| EATCHIP | European Air Traffic Control Harmonisation and Integration Programme |
| EATMP   | European Air Traffic Management Programme                            |
| EC      | European Commission  |
| ECAC    | European Civil Aviation Conference                                   |
| EET     | Estimated Elapsed Time   |
| EFIS    | Electronic Flight Instrument System                                  |

|             |  |
|-------------|--|
| EGNOS       | European Geostationary Overlay Service                           |
| EQPS        | Equipment and Systems (subject)                                  |
| ESARR       | Eurocontrol Safety Regulatory Requirements                       |
| ETF         | European Transport Workers' Federation                           |
| EUROCONTROL | European Organisation for the Safety of Air Navigation           |
| FAB         | Functional Airspace Block  |
| FDPS        | Flight Data Processing System                                    |
| FIR         | Flight Information Region  |
| FIS         | Flight Information Service                                       |
| FMS         | Flight Management System   |
| FPB         | Flight Progress Board  |
| FPL         | Flight Plan  |
| FUA         | Flexible Use of Airspace   |
| GAIN Report | Global Aviation Information Network Report                       |
| GBAS        | Ground Based Augmentation System                                 |
| GLONASS     | Global Orbiting Navigation Satellite System                      |
| GNSS        | Global Navigation Satellite System                               |
| GP          | Glide Path   |
| GPS         | Global Positioning System  |
| GPWS        | Ground Proximity Warning System                                  |
| GUI         | Guidelines   |
| HBK         | Handbook   |
| HF          | High Frequency   |
| HUM         | Human Factors (subject)  |
| IACA        | International Air Carrier Association                            |
| IAOPA       | International Council of Aircraft Owner and Pilot Associations   |
| IATA        | International Air Transport Association                          |
| ICAO        | International Civil Aviation Organisation                        |
| IFALPA      | International Federation of Airline Pilots Association           |
| IFATCA      | International Federation of Air Traffic Controllers Associations |
| IFPS        | Integrated Initial Flight Plan Processing System                 |
| IFR         | Instrument Flight Rules  |
| ILS         | Instrument Landing System  |
| IMC         | Instrument Meteorological Conditions                             |
| INS         | Inertial Navigation System                                       |
| INTR        | Introduction to the course (subject)                             |
| IRS         | Inertial Reference System  |
| IRVR        | Instrument Runway Visual Range                                   |

|        |   |
|--------|---|
| ISA    | International Standard Atmosphere                 |
| ITU    | International Telecommunications Union            |
| LAW    | Aviation Law (subject)                            |
| LDA    | Landing Distance Available                        |
| LLZ    | Localizer   |
| LNAV   | Lateral Navigation                                |
| LOA    | Letter of Agreement                               |
| LPV    | Lateral Precision with Vertical guidance approach |
| MET    | Meteorology                                       |
| METAR  | Meteorological Aviation Routine Weather Report    |
| MLS    | Microwave Landing System                          |
| Mode A | SSR identification code                           |
| Mode C | SSR Mode C (Pronounced: Mode Charlie)             |
| Mode S | Mode Select                                       |
| MONA   | Monitoring Aids                                   |
| MSAW   | Minimum Safe Altitude Warning                     |
| MTCD   | Medium Term Conflict Detection                    |
| MWO    | Meteorological Watch Office                       |
| NAV    | Navigation (subject)                              |
| NAVAID | Navigation(al) Aid                                |
| NDB    | Non-Directional Beacon                            |
| No.    | Number  |
| NOTAM  | Notice to Airmen                                  |
| OJT    | On the Job Training                               |
| OLDI   | On-Line Data Interchange                          |
| P-RNAV | Precision Area Navigation                         |
| PANS   | Procedures for Air Navigation Services            |
| PAPI   | Precision Approach Path Indicator                 |
| PAR    | Precision Approach Radar                          |
| PBN    | Performance Based Navigation                      |
| PCN    | Pavement Classification Number                    |
| PEN    | Professional Environment (subject)                |
| PSR    | Primary Surveillance Radar                        |
| PTP    | Part Time Practice                                |
| QDM    | Magnetic Heading                                  |
| QDR    | Magnetic Bearing                                  |
| QFE    | Atmospheric pressure at aerodrome elevation       |
| QNH    | Atmospheric pressure at mean sea level            |

|               |   |
|---------------|---|
| QTF           | The position of the transmitting station according to the bearings taken by the D/F station |
| RAIM          | Receiver Autonomous Integrity Monitoring  |
| RCC           | Rescue Coordination Centre  |
| RDPS          | Radar Data Processing System  |
| RNAV          | Area Navigation   |
| RNP           | Required Navigation Performance   |
| RNP-RNAV      | Required Navigation Performance-Area Navigation   |
| ROC           | Rate of Climb   |
| RPL           | Stored Flight Plan  |
| RTF           | Radio Telephony   |
| RVR           | Runway Visual Range   |
| RVSM          | Reduced Vertical Separation Minimum   |
| SADIS         | Satellite Distribution of World Area Forecast System  |
| SAR           | Search and Rescue   |
| SARPs         | Standards and Recommended Practices (ICAO)  |
| SBAS          | Satellite Based Augmentation System   |
| SELCAL        | Selective Calling   |
| SERA          | Standardised European Rules of the Air  |
| SHELL (model) | Software, Hardware, Environment, Live ware, Live ware Model                                 |
| SID           | Standard Instrument Departure (Route)   |
| SIGMET        | Significant Meteorological Information  |
| SMR           | Surface Movement Radar  |
| SNOWTAM       | NOTAM on SNOW conditions  |
| SPECI         | Aviation Selected Special Weather Report  |
| SRC           | Safety Regulation Commission  |
| SRU           | Safety Regulation Unit  |
| SSR           | Secondary Surveillance Radar  |
| STCA          | Short Term Conflict Alert   |
| SVFR          | Special Visual Flight Rules Flight  |
| TACAN         | UHF Tactical Air Navigation Aid   |
| TAF           | Terminal Area (Aerodrome) Forecast  |
| TCAC          | Tropical Cyclone Advisory Centre  |
| TODA          | Take Off Distance Available   |
| TORA          | Take Off Run Available  |
| TRM           | Team Resource Management  |
| TSA           | Temporary Segregated Area   |
| TWR           | Tower Control Unit (Aerodrome Control Tower)  |

|        |  |
|--------|--|
| UDES   | Unusual Degraded Emergency Situations    |
| UDF    | Ultra High Frequency Direction Finder    |
| UHF    | Ultra High Frequency                     |
| UTC    | Coordinated Universal Time               |
| VAAC   | Volcanic Ash Advisory Centre             |
| VASI   | Visual Approach Slope Indicator          |
| VDF    | Very High Frequency Direction Finder     |
| VFR    | Visual Flight Rules                      |
| VHF    | Very High Frequency                      |
| VMC    | Visual Meteorological Conditions         |
| VNAV   | Vertical Navigation                      |
| VOLMET | Routine Weather Reports Broadcast on VHF |
| VOR    | VHF Omni-directional Radio Range         |
| WAFC   | World Area Forecast Centre               |
| WAFS   | World Area Forecast System               |
| WGS-84 | World Geodetic System 84                 |

**ANNEX 1 - PART-ATCO**  
**SUBPART D - ATCO TRAINING**  
**Section 2 - Initial training requirements for Air Traffic Controllers**

**AMC1 to Appendix 7**  
**Area Control Procedural Rating (ACP)**

- A. General principles that apply to this AMC are contained in ~~the~~~~its~~ ~~enclosed~~ Supplement ~~1~~~~to AMC1~~.
- B. ATCO Rating training Area Control Procedural Rating (ACP) should contain the following ~~subject objectives~~ and training objectives that are associated with the subjects, ~~subject objectives~~, topics and subtopics contained in **Appendix 7 - Area Control Procedural Rating (ACP)**
- C. Subjects, ~~subject objectives~~, topics and subtopics from ~~the~~Appendix 7 are repeated in this AMC for the convenience of the reader and do not form a part of it.

## NPA -> CRD TRACK CHANGES FILE

This document has been provided to help reviewers make a comparison between the corresponding AMCs to appendices of the NPA 2012-18 (15 Nov 2012) and the CRD (30 Sep 2013) of Licensing and medical certification of air traffic controllers Implementing Rule - Part (B.V) ATCO Initial training requirements.

To decode the changes the following conventions have been used:

**Deleted** information is shown with the ~~strikethrough-effect~~

**Relocated** information is shown with the ~~strikethrough-effect~~

**New** information is shown in ~~blue text~~.

When an existing objective has been relocated (and consequently renumbered) the new number is shown in black to the left of the objective and the original number in red below the new one.

3.2.1 - current objective number (if not modified it is the same as in NPA 2012-18 (B.V))

3.3.3 - old objective number that may have an additional subject indication if moved from one subject to another or B(asic) and R(ating) if moved from one syllabus to another

1.5.3 - new objective number for relocated objectives at its original location that may have an additional indication of a new subject or B(asic) and R(ating) if moved from one syllabus to another



## TABLE OF CONTENTS

|  |    |
|--|----|
| SUBJECT 1: INTRODUCTION TO THE COURSE-----   | 3  |
| SUBJECT 2: AVIATION LAW-----   | 5  |
| SUBJECT 3: AIR TRAFFIC MANAGEMENT-----   | 7  |
| SUBJECT 4: METEOROLOGY-----  | 16 |
| SUBJECT 5: NAVIGATION-----   | 17 |
| SUBJECT 6: AIRCRAFT-----   | 18 |
| SUBJECT 7: HUMAN FACTORS-----  | 20 |
| SUBJECT 8: EQUIPMENT AND SYSTEMS-----  | 25 |
| SUBJECT 9: PROFESSIONAL ENVIRONMENT-----   | 28 |
| SUBJECT 10: <del>UNUSUAL/DEGRADED</del> ABNORMAL AND EMERGENCY<br>SITUATIONS ----- | 29 |
| Supplements -----  | 32 |

## Subject 1 : INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

### TOPIC INTR 1 COURSE MANAGEMENT

| Subtopic          | INTR 1.1  | Course introduction                       |  |     |
|-------------------|---|---|--|-----|
| ACP<br>INTR 1.1.1 | Explain the aims and main objectives of the course.                 | 2   |  | ALL |
| Subtopic          | INTR 1.2  | Course administration                     |  |     |
| ACP<br>INTR 1.2.1 | State course administration.  | 1   |  | ALL |
| Subtopic          | INTR 1.3  | Study material and training documentation |  |     |
| ACP<br>INTR 1.3.1 | Use appropriate documentation and their sources for course studies. | 3   | Optional content: Training documentation, library, CBT library, Web, Learning Management Server                    | ALL |
| ACP<br>INTR 1.3.2 | Integrate appropriate information into course studies.              | 4   | Training documentation<br>Optional content: <del>Training documentation</del> , supplementary information, library | ALL |

### TOPIC INTR 2 INTRODUCTION TO THE ATC TRAINING COURSE

| Subtopic          | INTR 2.1  | Course content and organisation |  |     |
|-------------------|---|---------------------------------|--|-----|
| ACP<br>INTR 2.1.1 | State the different training methods applied in the course. | 1                               | Theoretical training, practical training, self-study, types of training events                                   | ALL |
| ACP<br>INTR 2.1.2 | State the subjects of the course and their purpose.         | 1                               |  | ALL |
| ACP<br>INTR 2.1.3 | Describe the organisation of theoretical training.          | 2                               | Optional content: course programme   | ALL |
| ACP<br>INTR 2.1.4 | Describe the organisation of practical training.            | 2                               | Optional content: PTP, Simulation, Briefing, Debriefing, course programme  | ALL |
| Subtopic          | INTR 2.2  | Training ethos                  |  |     |
| ACP<br>INTR 2.2.1 | Recognise the feedback mechanisms available.                | 1                               | Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback | ALL |
| Subtopic          | INTR 2.3  | Assessment process              |  |     |

---

|                   |                                  |   |     |
|-------------------|----------------------------------|---|-----|
| ACP<br>INTR 2.3.1 | Describe the assessment process. | 2 | ALL |
|-------------------|----------------------------------|---|-----|

---

## Subject 2 : AVIATION LAW

The subject objective is:

Learners shall ~~+~~ know, understand and apply the Rules of the Air and the Regulations regarding reporting, airspace and ~~+~~ appreciate the Licensing and Competence principles.

### TOPIC LAW 1 ATCO LICENSING / CERTIFICATE OF COMPETENCE

| Subtopic                             | LAW 1.1   | Privileges and conditions |  |     |
|--------------------------------------|---|---------------------------|--|-----|
| ACP<br>LAW 1.1.1                     | Appreciate the conditions which <del>must</del> shall be met <del>to for the</del> issue <del>an of</del> Area Control Procedural rating. | 3                         | Commission Regulation (EU) <del>on ATCO Licensing No xxx/yyyy 805/2011</del> | ACP |
| Optional content: National documents |   |                           |  |     |
| ACP<br>LAW 1.1.2<br>6.1.1 HUM        | Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.                 | 2                         |  | ALL |
| ACP<br>LAW 1.1.3<br>1.1.2            | Explain the conditions for suspension/revocation of ATCO licence.   | 2                         | Commission Regulation (EU) <del>on ATCO Licensing No xxx/yyyy 805/2011</del> | ALL |

### TOPIC LAW 2 RULES AND REGULATIONS

| Subtopic         | LAW 2.1  | Reports  |  |     |
|------------------|--|----------|--|-----|
| ACP<br>LAW 2.1.1 | List the standard forms for reports.   | 1        | Air traffic incident report<br><br><i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>  | ALL |
| ACP<br>LAW 2.1.2 | Describe the functions of, and processes for, reporting.   | 2        | Reporting culture, Air traffic incident report<br><br><i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>                                | ALL |
| ACP<br>LAW 2.1.3 | Use forms for reporting.   | 3        | Air traffic incident reporting form(s)<br><br><i>Optional content: ICAO Doc 4444 Appendix 4, routine air reports, breach of regulations, watch/log book, records</i>                       | ALL |
| Subtopic         | LAW 2.2  | Airspace |  |     |
| ACP<br>LAW 2.2.1 | Appreciate classes and structure of airspace and their relevance to Area Control Procedural rating operations. | 3        |  | ACP |
| ACP<br>LAW 2.2.2 | Provide planning, coordination and control actions appropriate to the airspace classification and structure.   | 4        | <i>Optional content: ICAO Annex 2, ICAO Annex 11, International requirements, Civil requirements, Military requirements, Areas of responsibility, Sectorisation, National requirements</i> | ALL |

|   |  |   |  |     |
|---|--|---|--|-----|
| ACP<br>LAW 2.2.3                                    | Appreciate responsibility for terrain clearance.   | 3 |  | ALL |
| <b>TOPIC LAW 3 ATC SAFETY MANAGEMENT</b>            |  |   |  |     |
| <b>Subtopic LAW 3.1 Experience-Feedback process</b> |  |   |  |     |
| ACP<br>LAW 3.1.1<br>10.1.1 HUM                      | State the importance of <del>the</del> controllers contribution to the <del>experience</del> feedback process. | 1 | Optional content: voluntary reporting  | ALL |
| ACP<br>LAW 3.1.2<br>10.1.2 HUM                      | Describe how reported occurrences are analysed.  | 2 | Optional content: ESARR 2, local procedures  | ALL |
| ACP<br>LAW 3.1.3<br>10.1.3 HUM                      | Name the means used to disseminate recommendations.  | 1 | Optional content: Safety letters, safety boards web pages                          | ALL |
| ACP<br>LAW 3.1.4<br>10.1.4 HUM                      | <del>Appreciate</del> <del>Explain</del> the 'Just Culture' concept.   | 3 | Benefits, prerequisites, constraints<br>Optional content: EAM 2 GUI 6, GAIN Report | ALL |
| <b>Subtopic LAW 3.2 Safety Investigation-Branch</b> |  |   |  |     |
| ACP<br>LAW 3.2.1<br>10.2.1 HUM                      | Describe role and mission of Safety Investigation <del>Branch</del> in the improvement of safety.              | 2 |  | ALL |
| ACP<br>LAW 3.2.2<br>10.2.2 HUM                      | Define working methods of Safety Investigation <del>Branch</del> .   | 1 |  | ALL |

### Subject 3 : AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

| TOPIC     | ATM 1  | <b>PROVISION OF SERVICES <del>AIR TRAFFIC SERVICES AND AIRSPACE MANAGEMENT</del></b> |   |     |
|-----------|--|--|---|-----|
| Subtopic  | ATM 1.1  | <b>Air traffic control (ATC) service</b>   |   |     |
| ACP       | Appreciate own area of responsibility.   | 3  |   | APP |
| ATM 1.1.1 |  |  |   | ACP |
| 1.1.2     |  |  |   | APS |
|           |  |  |   | ACS |
| ACP       | Provide <del>the appropriate</del> <b>ATC</b> area control service.  | 4  | ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals  | ACP |
| ATM 1.1.2 |  |  |   | ACS |
| 1.1.1     |  |  |   |     |
| Subtopic  | ATM 1.2  | <b>Flight information service (FIS)</b>  |   |     |
| ACP       | Provide FIS.   | 4  | ICAO Doc 4444   | ALL |
| ATM 1.2.1 |  |  | <i>Optional content: national documents</i>   |     |
| 1.2.2     |  |  |   |     |
| ACP       | <b>Issue</b> <del>Relay</del> appropriate information concerning the location of <del>other</del> conflicting traffic. | 3  | ICAO Doc 4444, Traffic information, Essential traffic information   | APP |
| ATM 1.2.2 |  |  |   | ACP |
| 1.2.1     |  |  |   | APS |
|           |  |  |   | ACS |
| Subtopic  | ATM 1.3  | <b>Alerting service (ALRS)</b>   |   |     |
| ACP       | Provide ALRS.  | 4  | ICAO Doc 4444   | ALL |
| ATM 1.3.1 |  |  | <i>Optional content: national documents</i>   |     |
| ACP       | Respond to distress and urgency messages and signals.  | 3  | ICAO Annex 10, ICAO Doc 4444,   | ALL |
| ATM 1.3.2 |  |  | <i>Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations</i>     |     |
| Subtopic  | ATM 1.4  | <b>ATS System capacity and air traffic flow management</b>                           |   |     |
| ACP       | Appreciate principles of <del>ATFM</del> <b>ATS</b> system capacity and air traffic flow management.                   | 3  | <i>Optional content: EUROCONTROL ATFCM Users Manual <del>Working principles of ATFM</del>, FABs, FUA, free flight, etc.</i> | APP |
| ATM 1.4.1 |  |  |   | ACP |
|           |  |  |   | APS |
|           |  |  |   | ACS |
| ACP       | Apply flow management procedures <b>in the provision of ATC.</b>   | 3  | <i>Optional content: EUROCONTROL ATFCM Users Manual</i>   | APP |
| ATM 1.4.2 |  |  |   | ACP |
|           |  |  |   | APS |
|           |  |  |   | ACS |

|  |  |   |   |                          |
|--|--|---|---|--------------------------|
| ACP<br>ATM 1.4.3                                       | Organise traffic flows and patterns to take account of airspace boundaries.          | 4 | <i>Optional content: Civil and Military, Controlled, Uncontrolled, Advisory, Restricted, Danger, Prohibited, Special rules, Sector boundaries, National boundaries, FIR boundaries, Delegated airspace, Transfer of control, Transfer of communications, En-route, Off-route</i>  | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 1.4.4                                       | Organise traffic flows and patterns to take account of areas of responsibility.      | 4 | <i>Optional content: EUROCONTROL ATFCM Users Manual</i>   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 1.4.5                                       | Inform supervisor of situation.  | 3 | <i>Optional content: Abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, , unusual meteorological conditions, relevant information like: reported ground-based incidents, forest fire, smoke, oil pollution</i> | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 1.5 Airspace management (ASM)</b>      |  |   |   |                          |
| ACP<br>ATM 1.5.1                                       | Appreciate the principles and means of ASM.  | 3 | <i>Optional content: FABs, FUA, ICAO Doc 4444, EUROCONTROL ASM HBK - Airspace Management Handbook for the application of FUA, TSAs, CDRs, CBAs</i>  | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 1.5.2                                       | Organise traffic to take account of ASM.   | 4 | <i>Optional content: CDR, TSA, TRA, CBA, real-time activation, deactivation or reallocation of airspace</i>   | APP<br>ACP               |
| <b>TOPIC ATM 2 COMMUNICATION</b>                       |  |   |   |                          |
| <b>Subtopic ATM 2.1 Effective communication</b>        |  |   |   |                          |
| ACP<br>ATM 2.1.1                                       | Use approved phraseology.  | 3 | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2</i>   | ALL                      |
| ACP<br>ATM 2.1.2                                       | Ensure effective <del>Perform</del> communication.<br><del>effectively.</del>        | 4 | Communication techniques, Readback/verification of readback   | ALL                      |
| ACP<br>ATM <del>2.1.3</del><br>6.1.2 HUM               | <del>Analyse examples of pilot and controller communication for effectiveness.</del> | 4 |   | ALL                      |
| <b>TOPIC ATM 3 ATC CLEARANCES AND ATC INSTRUCTIONS</b> |  |   |   |                          |
| <b>Subtopic ATM 3.1 ATC clearances</b>                 |  |   |   |                          |
| ACP<br>ATM 3.1.1                                       | Issue appropriate ATC clearances.  | 3 | ICAO Doc 4444<br><i>Optional content: national documents</i>  | ALL                      |

|  |  |   |  |     |
|--|--|---|--|-----|
| ACP<br>ATM 3.1.2   | Integrate appropriate ATC clearances in control service.               | 4 |  | ALL |
| ACP<br>ATM 3.1.3   | Ensure the agreed course of action is carried out.                     | 4 |  | ALL |
| <b>Subtopic ATM 3.2 ATC instructions</b>                   |  |   |  |     |
| ACP<br>ATM 3.2.1   | Issue appropriate ATC instructions.                                    | 3 | ICAO Doc 4444<br><i>Optional content: national documents</i>   | ALL |
| ACP<br>ATM 3.2.2   | Integrate appropriate ATC instructions in control service.             | 4 |  | ALL |
| ACP<br>ATM 3.2.3   | Ensure the agreed course of action is carried out.                     | 4 |  | ALL |
| <b>TOPIC ATM 4 COORDINATION</b>                            |  |   |  |     |
| <b>Subtopic ATM 4.1 Necessity for coordination</b>         |  |   |  |     |
| ACP<br>ATM 4.1.1   | Identify the need for coordination.                                    | 3 |  | ALL |
| <b>Subtopic ATM 4.2 Tools and methods for coordination</b> |  |   |  |     |
| ACP<br>ATM 4.2.1   | Use the available tools for coordination.                              | 3 | <i>Optional content: Electronic transfer of flight data, Telephone, Interphone, Intercom, Direct speech, Radiotelephone (RTF), Local agreements, automated system coordination</i> | ALL |
| <b>Subtopic ATM 4.3 Coordination procedures</b>            |  |   |  |     |
| ACP<br>ATM 4.3.1   | Initiate appropriate coordination.                                     | 3 | Delegation/transfer of responsibility for air-ground communications and separation, transfer of control, etc.<br>ICAO Doc 4444<br><i>Optional content: release point</i>           | ALL |
| ACP<br>ATM 4.3.2   | Analyse effect of coordination requested by an adjacent position/unit. | 4 | <i>Optional content: Delegation/transfer of responsibility for air-ground communications and separation, release point, transfer of control, etc.</i>                              | ALL |
| ACP<br>ATM 4.3.3   | Select, after negotiation, an appropriate course of action.            | 5 | <del>When additional traffic cannot be accepted by adjacent position/unit ;<br/>When additional traffic cannot be accepted by own position/unit, etc.</del>                        | ALL |
| ACP<br>ATM 4.3.4   | Ensure the agreed course of action is carried out.                     | 4 |  | ALL |



|                  |                                      |   |               |     |
|------------------|--------------------------------------|---|---------------|-----|
| ACP<br>ATM 4.3.5 | Coordinate in the provision of FIS.  | 4 | ICAO Doc 4444 | ALL |
| ACP<br>ATM 4.3.6 | Coordinate in the provision of ALRS. | 4 | ICAO Doc 4444 | ALL |

## TOPIC ATM 5 ALTIMETRY AND LEVEL ALLOCATION

| Subtopic         | ATM 5.1  | Altimetry         |   |            |  |
|------------------|--|-------------------|---|------------|--|
| ACP<br>ATM 5.1.1 | Allocate levels <del>(height, altitude, flight level)</del> according to altimetry data.                                   | 4                 | ICAO Doc 8168, ICAO Doc 4444  | ALL        |  |
| ACP<br>ATM 5.1.2 | Ensure separation according to altimetry data.   | 4                 | Optional content: Transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries | ALL        |  |
| Subtopic         | ATM 5.2  | Terrain clearance |   |            |  |
| ACP<br>ATM 5.2.1 | Provide planning, coordination and control actions appropriate to the rules for minimum safe levels and terrain clearance. | 4                 | Optional content: Terrain clearance dimensions, Minimum safe altitudes, Transition level, Minimum flight level, Minimum sector altitude             | APP<br>ACP |  |

## TOPIC ATM 6 SEPARATIONS

| Subtopic         | ATM 6.1  | Vertical separation   |   |  |                          |
|------------------|--|-----------------------|---|--|--------------------------|
| ACP<br>ATM 6.1.1 | Provide standard vertical separation.                        |                       | 4 | ICAO Doc 4444, ICAO Doc 7030, Level allocation, During climb/descent, Rate of climb/descent, RVSM, non-RVSM aircraft, <a href="#">holding pattern</a>  | ACP<br>ACS               |
| ACP<br>ATM 6.1.2 | Provide increased vertical separation.                       |                       | 4 | ICAO Doc 4444, ICAO Doc 7030<br><i>Optional content: Level allocation, During climb/descent, Rate of climb/descent</i>   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 6.1.3 | Appreciate the application of vertical emergency separation. |                       | 3 | ICAO Doc 4444, ICAO Doc 7030   | APP<br>ACP<br>APS<br>ACS |
| Subtopic         | ATM 6.2  | Horizontal separation |   |  |                          |
| ACP<br>ATM 6.2.1 | Provide longitudinal separation.                             |                       | 4 | Based on time, Based on distance (DME and/or GNSS, RNAV), <del>Based on time and -ATS surveillance systems observation - European Region only</del><br><i>Optional content: Based on time with Mach number technique</i> | ACP                      |
| ACP<br>ATM 6.2.2 | Provide lateral separation.                                  |                       | 4 | ICAO Doc 4444, ICAO Doc 7030, <a href="#">holding</a>  | APP<br>ACP               |

|  |  |   |   |                          |
|--|--|---|---|--------------------------|
| ACP<br>ATM 6.2.3   | Provide track separation.  | 4 |   | ACP<br>APP               |
| ACP<br>ATM 6.2.4   | Provide geographical separation.   | 4 | Visual, Using navigation aids, Area Navigation  | ACP<br>APP               |
| <b>Subtopic ATM 6-3 Delegation of separation</b>                                     |  |   |   |                          |
| ACP<br>ATM 6-3-1   | <del>Provide contingency separation in the event of a navigation aid failure.</del>  | 4 | <del>Vertical, Standard, Emergency</del>  | APP<br>ACP               |
| <b>TOPIC ATM 7 AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS</b> |  |   |   |                          |
| <b>Subtopic ATM 7.1 Airborne collision avoidance systems</b>                         |  |   |   |                          |
| ACP<br>ATM 7.1.1<br>7.1.6 B  | Differentiate between ACAS advisory thresholds and <del>ATC</del> separation standards applicable in the area control environment. | 2 | ICAO Doc 9863<br><i>Optional content: EUROCONTROL TCAS Web page</i>   | ACP<br>ACS               |
| ACP<br>ATM 7.1.2<br>7.1.4 B  | Describe the controller responsibility during and following an ACAS RA reported by pilot.  | 2 | ICAO Doc 4444   | ALL                      |
| ACP<br>ATM 7.1.3<br>7.1.1  | Respond to pilot notification of actions based on airborne systems warnings.   | 3 | ACAS, TAWS<br><i>Optional content: GPWS<br/>EUROCONTROL TCAS Web page</i>   | APP<br>ACP<br>APS<br>ACS |
| <b>TOPIC ATM 8 DATA DISPLAY</b>  |  |   |   |                          |
| <b>Subtopic ATM 8.1 Data management</b>  |  |   |   |                          |
| ACP<br>ATM 8.1.1   | Update the data display to accurately reflect the traffic situation.   | 3 | <i>Optional content: Information displayed, strip marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs</i> | ALL                      |
| ACP<br>ATM 8.1.2   | Analyse pertinent data on data displays.   | 4 |   | ALL                      |
| ACP<br>ATM 8.1.3   | Organise pertinent data on data displays.  | 4 |   | ALL                      |
| ACP<br>ATM 8.1.4<br>8.1.5  | <del>Process pertinent data on data displays.</del>  | 3 |   | ALL                      |
| ACP<br>ATM 8.1.4<br>8.1.5  | Obtain flight plan information.  | 3 | CPL, FPL, Supplementary information<br><i>Optional content: RPL, AFIL, etc.</i>   | ALL                      |

|  |  |   |  |                          |
|--|--|---|--|--------------------------|
| ACP<br>ATM 8.1.5<br>8.1.6  | Use flight plan information.   | 3 |  | ALL                      |
| <b>TOPIC ATM 9 OPERATIONAL ENVIRONMENT (SIMULATED)</b>                         |  |   |  |                          |
| <b>Subtopic ATM 9.1 Integrity of the operational environment</b>               |  |   |  |                          |
| ACP<br>ATM 9.1.1   | Obtain information concerning the operational environment.                 | 3 | <i>Optional content: Briefing, notices, local orders, verification of information</i>                      | ALL                      |
| ACP<br>ATM 9.1.2   | Ensure the integrity of the operational environment.                       | 4 | <i>Optional content: Integrity of displays, Verification of the information provided by displays, etc.</i> | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 9.2 Verification of the currency of operational procedures</b> |  |   |  |                          |
| ACP<br>ATM 9.2.1   | Check all relevant documentation before managing traffic.                  | 3 | <i>Optional content: Briefing, LOAs, NOTAM, AICs</i>   | ALL                      |
| ACP<br>ATM 9.2.2   | Manage traffic in accordance with procedural changes.                      | 4 |  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 9.3 Handover-takeover</b>                                      |  |   |  |                          |
| ACP<br>ATM 9.3.1   | Transfer information to the relieving controller.                          | 3 |  | ALL                      |
| ACP<br>ATM 9.3.2   | Obtain information from the controller handing over.                       | 3 |  | ALL                      |
| <b>TOPIC ATM 10 PROVISION OF CONTROL SERVICE</b>                               |  |   |  |                          |
| <b>Subtopic ATM 10.1 Responsibility and processing of information</b>          |  |   |  |                          |
| ACP<br>ATM 10.1.1  | Describe the division of responsibility between air traffic control units. | 2 | ICAO Doc 4444  | ALL                      |
| ACP<br>ATM 10.1.2  | Describe the responsibility in regard to military traffic.                 | 2 | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9554</i>  | ALL                      |
| ACP<br>ATM 10.1.3<br>10.1.9  | Describe the responsibility in regard to unmanned free balloons.           | 2 | ICAO Doc 4444  | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.1.4<br>10.1.3  | Obtain operational information.  | 3 | ICAO Doc 4444,<br>Local operation manuals  | APP<br>ACP<br>APS<br>ACS |

|   |   |   |   |                          |
|---|---|---|---|--------------------------|
| ACP<br>ATM 10.1.5<br>10.1.4                         | Interpret operational information.  | 5 |   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.1.6<br>10.1.5                         | Organise forwarding of operational information.   | 4 | <i>Optional content: including the use of backup procedures</i>                   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.1.7<br>10.1.6                         | Integrate operational information into control decisions.   | 4 |   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.1.7<br>10.3.6                         | <del>Ensure an adequate priority of actions.</del>  | 4 | <del>Formal and situational requirements, workload</del>                          | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.1.8<br>3.5.1 ACFT                     | Appreciate the influence of operational requirements.   | 3 | <i>Optional content: Military flying, Calibration flights, Aerial photography</i> | ALL                      |
| ACP<br>ATM 10.1.8<br>10.4.2                         | <del>Balance the workload with the traffic demand.</del>  | 5 | <i>Optional content: in own sector, in adjacent sectors</i>                       | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 10.2 Area control</b>               |   |   |   |                          |
| ACP<br>ATM 10.2.1                                   | Explain the responsibility for the provision of an area procedural control service.               | 2 | ICAO Doc 4444, ICAO Annex 11, Local operation manuals                             | ACP                      |
| ACP<br>ATM 10.2.2                                   | Provide planning, coordination and control actions appropriate to the VFR and IFR in VMC and IMC. | 4 | ICAO Annex 2, ICAO Annex 11, ICAO Doc 4444  | ACP                      |
| <b>Subtopic ATM 10.3 Traffic management process</b> |   |   |   |                          |
| ACP<br>ATM 10.3.1                                   | Ensure that situational awareness is maintained.  | 4 | Information gathering, traffic projection   | APP<br>ACP               |
| ACP<br>ATM 10.3.2                                   | Detect conflicts in time for appropriate resolution.  | 4 |   | ALL                      |
| ACP<br>ATM 10.3.3                                   | Identify potential solutions to achieve a safe and effective traffic flow.                        | 3 |   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.3.4                                   | Evaluate possible outcomes of different planning and control actions.                             | 5 |   | APP<br>ACP<br>APS<br>ACS |

|   |   |   |   |                          |
|---|---|---|---|--------------------------|
| ACP<br>ATM 10.3.5                                       | Select an appropriate plan in time to achieve safe and effective traffic flow.  | 5 |   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.3.6<br>10.1.7                             | Ensure an adequate priority of actions.   | 4 | Formal and situational requirements, workload   | ALL                      |
| ACP<br>ATM 10.3.7                                       | Execute selected plan in a timely manner.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.3.8                                       | Ensure a safe and efficient outcome is achieved.  | 4 | Traffic monitoring, adaptability and follow up  | ALL                      |
| <b>Subtopic ATM 10.4 Handling traffic</b>               |   |   |   |                          |
| ACP<br>ATM 10.4.1                                       | Manage arrivals, departures and overflights.  | 4 |   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 10.4.2<br>10.1.8                             | Balance the workload <del>with the traffic demand</del> against personal capacity.  | 5 | Optional content: <del>in own sector, in adjacent sectors</del> re-routing, re-planning, prioritising solutions, denying requests, delegating responsibility for separation | APP<br>ACP<br>APS<br>ACS |
| <b>TOPIC ATM 11 HOLDING</b>                             |   |   |   |                          |
| <b>Subtopic ATM 11.1 General holding procedures</b>     |   |   |   |                          |
| ACP<br>ATM 11.1.1                                       | Apply holding procedures.   | 3 | ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 11.1.2                                       | Appreciate the factors affecting holding patterns. <del>effect of: wind, aircraft speed, rate of turn, height, aircraft type, aircraft performance.</del> | 3 | effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 11.2 Vertical separation in holding</b> |   |   |   |                          |
| ACP<br>ATM 11.2.1<br>6.1.1                              | <del>Provide vertical separation between aircraft in a holding pattern.</del>   | 4 |   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ATM 11.2.2<br>6.1.1                              | <del>Provide vertical separation between aircraft in a holding pattern and other aircraft.</del>  | 4 |   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 11.2 Holding aircraft</b>               |   |   |   |                          |

---

|            |                                     |   |     |
|------------|-------------------------------------|---|-----|
| ACP        | Calculate expected onward clearance | 3 | ACP |
| ATM 11.2.1 | times.                              |   | ACS |
| 11.3.1     |                                     |   |     |

---

## Subject 4 : METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

### TOPIC MET 1 METEOROLOGICAL PHENOMENA

| Subtopic                             | MET 1.1   | Meteorological phenomena |   |                          |
|--------------------------------------|---|--------------------------|---|--------------------------|
| ACP<br>MET 1.1.1                     | Appreciate the impact of adverse weather.   | 3                        | Thunderstorms, Icing, Jet streams, Clear Air Turbulence (CAT), Turbulence, Microburst, Severe mountain waves, Line squalls, <b>Volcanic ash</b><br><br><i>Optional content: <del>Volcanic ash</del> Solar radiation</i> | ACP<br>ACS               |
| ACP<br>MET 1.1.2                     | Integrate data about meteorological phenomena into provision of ATS.  | 4                        | <b>clearances, instructions and transmitted information</b><br><br><i>Optional content: <b>relevant meteorological phenomena</b><br/><del>Separation, holding, diversions, re-routings, etc.</del></i>                  | ALL                      |
| ACP<br>MET <del>1.1.3</del><br>1.1.2 | <del>Integrate data about meteorological phenomena into clearances, instructions and transmitted information.</del> | 4                        | <del>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</del>  | APP<br>ACP<br>APS<br>ACS |
| ACP<br>MET 1.1.3<br>1.1.4            | Use techniques to avoid adverse weather when necessary/possible.  | 3                        | Rerouting, level change, etc.   | APP<br>ACP<br>APS<br>ACS |

### TOPIC MET 2 SOURCES OF METEOROLOGICAL DATA

| Subtopic         | MET 2.1                           | Sources of meteorological information |   |                          |
|------------------|-----------------------------------|---------------------------------------|---|--------------------------|
| ACP<br>MET 2.1.1 | Obtain meteorological information | 3                                     | METAR, TAF, SIGMET, AIRMET<br><br><i>Optional content: AIREP/AIREP Special</i>  | APP<br>ACP<br>APS<br>ACS |
| ACP<br>MET 2.1.2 | Relay meteorological information. | 3                                     | <b>ICAO Doc 4444</b> <del>To: aircraft, MET office</del><br><br><i>Optional content: flight information centre, adjacent ATS unit</i> | APP<br>ACP<br>APS<br>ACS |

## Subject 5 : NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

### TOPIC NAV 1 MAPS AND AERONAUTICAL CHARTS

| Subtopic  | NAV 1.1 | Maps and charts               |   |                          |
|-----------|---------|-------------------------------|---|--------------------------|
| ACP       |         | Use relevant maps and charts. | 3 |                          |
| NAV 1.1.1 |         |                               |   | APP<br>ACP<br>APS<br>ACS |

### TOPIC NAV 2 INSTRUMENTAL NAVIGATION

| Subtopic  | NAV 2.1 | Navigational systems  |   |  |
|-----------|---------|---|---|--|
| ACP       |         | Manage traffic in case of change in the operational status of navigational systems.                           | 4 | Optional content: limitations, status of ground-based and satellite-based systems  |
| NAV 2.1.1 |         |   |   | APP<br>ACP<br>APS<br>ACS   |
| ACP       |         | Appreciate the effect of precision, limitations and change of the operational status of navigational systems. | 3 | Optional content: limitations, status, degraded procedures   |
| NAV 2.1.2 |         |   |   | ALL  |
| Subtopic  | NAV 2.2 | Navigational assistance   |   |  |
| ACP       |         | Evaluate the necessary information to be provided to pilots in need of navigational assistance.               | 5 | Optional content: Nearest most suitable aerodrome, Track, Heading, Distance, Aerodrome information, Any other navigational assistance relevant at the time |
| NAV 2.2.1 |         |   |   | APP<br>ACP<br>APS<br>ACS   |
| Subtopic  | NAV 2.3 | PBN applications  |   |  |
| ACP       |         | State the navigation applications used in terminal and en-route environments.                                 | 1 | Terminal-RNAV-1 (≈P-RNAV); En-route-RNAV-5 (B-RNAV)  |
| NAV 2.3.1 |         |   |   | Optional content: A-RNP, EC PBN Implementing Rule, ICAO Doc 9613   |
| ACP       |         | Explain the principles and designation of navigation specifications in use.                                   | 2 | Optional content: performance, functionality, sensors, aircrew and controller requirements   |
| NAV 2.3.2 |         |   |   | APP<br>ACP<br>APS<br>ACS   |
| ACP       |         | State future PBN developments.  | 1 | A-RNP, APV   |
| NAV 2.3.3 |         |   |   | Optional content: RNP 3D, RNP 4D   |
|           |         |   |   | ADI<br>APP<br>ACP<br>APS<br>ACS  |



**Subject 6 : AIRCRAFT**

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

**TOPIC ACFT 1 AIRCRAFT INSTRUMENTS**

| Subtopic                     | ACFT 1.1   | Aircraft instruments |   |                   |
|------------------------------|--|----------------------|---|-------------------|
| ACP<br>ACFT 1.1.1            | Integrate <del>the information indication</del> from aircraft instruments provided by the pilot in the provision of ATS. | 4                    | <del>Optional content: TCAS, wind shear indicator, weather radar</del>    | ALL               |
| ACP<br>ACFT 1.1.2            | Explain the operation of aircraft radio equipment.   | 2                    | Optional content: Radios (number of), emergency radios, <del>SELCAL</del> | ALL               |
| ACP<br>ACFT 1.1.3            | <del>Explain the operation of on-board surveillance equipment.</del>   | 2                    | <del>Transponders: equipment Mode A, Mode C, Mode S</del>                 | ADV<br>APP<br>ACP |
| ACP<br>ACFT <del>1.1.4</del> | <del>Explain the use and benefits of CPDLC.</del>  | 2                    |   | ALL               |

**TOPIC ACFT 2 AIRCRAFT CATEGORIES**

| Subtopic          | ACFT 2.1  | Wake turbulence <del>categories</del> |  |     |
|-------------------|---|---------------------------------------|--|-----|
| ACP<br>ACFT 2.1.1 | Explain the wake turbulence effect and associated hazards to the succeeding aircraft.                     | 2                                     |  | ALL |
| ACP<br>ACFT 2.1.2 | Appreciate the techniques used to prevent hazards associated with wake turbulence on succeeding aircraft. | 3                                     |  | ALL |

**TOPIC ACFT 3 FACTORS AFFECTING AIRCRAFT PERFORMANCE**

| Subtopic          | ACFT 3.1  | Climb factors   |  |                          |
|-------------------|---|-----------------|--|--------------------------|
| ACP<br>ACFT 3.1.1 | Integrate the influence of factors affecting aircraft during climb.   | 4               | Optional content: speed, mass, air density, <del>cabin pressurisation</del> , wind and temperature | APP<br>ACP<br>APS<br>ACS |
| Subtopic          | ACFT 3.2  | Cruise factors  |  |                          |
| ACP<br>ACFT 3.2.1 | Integrate the influence of factors affecting aircraft during cruise.  | 4               | <del>Level, cruising speed, wind, mass, cabin pressurisation</del>                                 | APP<br>ACP<br>APS<br>ACS |
| Subtopic          | ACFT 3.3  | Descent factors |  |                          |
| ACP<br>ACFT 3.3.1 | Integrate the influence of factors affecting aircraft during descent. | 4               | Optional content: wind, speed, rate of descent, cabin pressurisation                               | ACP<br>ACS               |

| Subtopic ACFT 3.4 Economic factors                 |   |   |   |                          |
|--|---|---|---|--------------------------|
| ACP<br>ACFT 3.4.1                                  | Integrate consideration of economic factors affecting aircraft.   | 4 | <i>Optional content: Routing, Level, Speed, Rate of climb and Rate of descent, Approach profile, Top of descent</i> | ACP<br>ACS               |
| ACP<br>ACFT 3.4.2                                  | Use continuous climb techniques where applicable.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ACFT 3.4.3                                  | Use direct routing where applicable.  | 3 |   | APP<br>ACP<br>APS<br>ACS |
| Subtopic ACFT 3.5 <del>Miscellaneous factors</del> |   |   |   |                          |
| ACP<br>ACFT <del>3.5.1</del><br>10.1.8 ATM         | <del>Appreciate the influence of operational requirements.</del>  | 3 | <del>Optional content: Military flying, Calibration flights, Aerial photography, banner towing</del>                | ACP<br>ACS               |
| Subtopic ACFT 3.5 Environmental factors            |   |   |   |                          |
| ACP<br>ACFT 3.5.1                                  | Appreciate the performance restrictions due to environmental constraints.   | 3 | <i>Optional content: Fuel dumping, Minimum flight levels, Continuous Descent Operations</i>                         | ACP<br>ACS               |
| TOPIC ACFT 4 AIRCRAFT DATA                         |   |   |   |                          |
| Subtopic ACFT 4.1 Performance data                 |   |   |   |                          |
| ACP<br>ACFT 4.1.1                                  | Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/working environment into the provision of a control service. | 4 | Performance data under a representative variety of circumstances  | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ACFT <del>4.1.2</del><br>1.1.2 ABES         | <del>Identify potential or actual emergency situations.</del>   | 3 |   | APP<br>ACP<br>APS<br>ACS |

## Subject 7 : HUMAN FACTORS

The subject objective is:

Learners shall ~~+~~ recognise the necessity to constantly extend their knowledge ~~+~~ and ~~+~~ analyse factors which affect personal and team performance.

### TOPIC HUM 1 PSYCHOLOGICAL FACTORS

| Subtopic         | HUM 1.1  | Cognitive |   |     |
|------------------|--|-----------|---|-----|
| ACP<br>HUM 1.1.1 | Describe the human information processing model.                               | 2         | Attention, perception, memory, situational awareness, decision making, response                                   | ALL |
| ACP<br>HUM 1.1.2 | Describe the factors which influence human information processing.             | 2         | Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations | ALL |
| ACP<br>HUM 1.1.3 | Monitor the effect of human information processing factors on decision making. | 3         | <i>Optional content: workload, stress, interpersonal relations, distraction, confidence</i>                       | ALL |

### TOPIC HUM 2 MEDICAL AND PHYSIOLOGICAL FACTORS

| Subtopic         | HUM 2.1  | Fatigue |  |     |
|------------------|--|---------|--|-----|
| ACP<br>HUM 2.1.1 | State factors that cause fatigue.  | 1       | Shift work<br><i>Optional content: night shifts and rosters</i>  | ALL |
| ACP<br>HUM 2.1.2 | Describe the onset of fatigue.   | 2       | <i>Optional content: Lack of concentration, Listlessness, Irritability, Frustration, ICAO Circular 241 – AN/145 Human factors in Air Traffic Control</i> | ALL |
| ACP<br>HUM 2.1.3 | Recognise the onset of fatigue in self.  | 1       | <i>Optional content: ICAO Circular 241 – AN/145 Human factors in Air Traffic Control</i>   | ALL |
| ACP<br>HUM 2.1.4 | Recognise the onset of fatigue in others.  | 1       |  | ALL |
| ACP<br>HUM 2.1.5 | <del>Describe</del> <del>Consider</del> appropriate action when recognising fatigue. | 2       |  | ALL |
| Subtopic         | HUM 2.2  | Fitness |  |     |
| ACP<br>HUM 2.2.1 | Recognise signs of lack of personal fitness.   | 1       |  | ALL |
| ACP<br>HUM 2.2.2 | Describe actions when aware of a lack of personal fitness.                           | 2       |  | ALL |

**TOPIC HUM 3 SOCIAL AND ORGANISATIONAL FACTORS**

| <b>Subtopic</b>  | <b>HUM 3.1</b>  | <b>Team resource management (TRM)</b> |  |     |
|------------------|---|---------------------------------------|--|-----|
| ACP<br>HUM 3.1.1 | State the <b>relevance objectives</b> of TRM.               | 1                                     | <i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>                                      | ALL |
| ACP<br>HUM 3.1.2 | State the content of the TRM concept.                       | 1                                     | <i>Optional content: team work, human error, team roles, stress, decision making, communication, situational awareness</i>           | ALL |
| <b>Subtopic</b>  | <b>HUM 3.2</b>  | <b>Teamwork and team roles</b>        |  |     |
| ACP<br>HUM 3.2.1 | Identify reasons for conflict.                              | 3                                     |  | ALL |
| ACP<br>HUM 3.2.2 | Describe actions to prevent human conflicts.                | 2                                     | <i>Optional content: TRM team roles</i>  | ALL |
| ACP<br>HUM 3.2.3 | Describe strategies to cope with human conflicts.           | 2                                     | <i>Optional content: in your team, in the simulator</i>  | ALL |
| <b>Subtopic</b>  | <b>HUM 3.3</b>  | <b>Responsible behaviour</b>          |  |     |
| ACP<br>HUM 3.3.1 | Consider the factors which influence responsible behaviour. | 2                                     | <i>Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality</i> | ALL |
| ACP<br>HUM 3.3.2 | Apply responsible judgement.                                | 3                                     | Case study and discussion about a dilemma situation  | ALL |

**TOPIC HUM 4 STRESS**

| <b>Subtopic</b>  | <b>HUM 4.1</b>  | <b>Stress</b>            |  |     |
|------------------|---|--------------------------|--|-----|
| ACP<br>HUM 4.1.1 | Recognise the effects of stress on performance.   | 1                        | Stress and its symptoms in self and in others  | ALL |
| <b>Subtopic</b>  | <b>HUM 4.2</b>  | <b>Stress management</b> |  |     |
| ACP<br>HUM 4.2.1 | Act to reduce stress.   | 3                        | The effect of personality in coping with stress, The benefits of active stress management                | ALL |
| ACP<br>HUM 4.2.2 | Respond to stressful situation by offering, asking or accepting assistance. <del>Obtain assistance in stressful situations.</del> | 3                        | <i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i> | ALL |
| ACP<br>HUM 4.2.3 | Recognise the effect of shocking and stressful events.  | 1                        | Self and others, Abnormal situations, CISM   | ALL |

|                  |  |   |   |     |
|------------------|--|---|---|-----|
| ACP<br>HUM 4.2.4 | Consider the benefits of Critical Incident Stress Management (CISM). | 2 |   | ALL |
| ACP<br>HUM 4.2.5 | Explain procedures used following an incident/accident.              | 2 | <i>Optional content: CISM, Counselling, Human element</i> | ALL |

## TOPIC HUM 5 HUMAN ERROR

| Subtopic         | HUM 5.1  | Human error        |  |     |
|------------------|--|--------------------|--|-----|
| ACP<br>HUM 5.1.1 | Explain the relationship between error and safety.                               | 2                  | Number and combination of errors, proactive versus reactive approach to discovery of error<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |
| ACP<br>HUM 5.1.2 | Differentiate between the types of error.  | 2                  | <i>Slips, Lapses, Mistakes</i><br><br><i>Optional content: <del>Slips, Lapses, Mistakes</del> ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>                          | ALL |
| ACP<br>HUM 5.1.3 | Describe error-prone conditions.   | 2                  | <i>Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences</i>  | ALL |
| ACP<br>HUM 5.1.4 | Collect examples of different error types, their causes and consequences in ATC. | 3                  | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ACP<br>HUM 5.1.5 | Explain how to detect errors to compensate for them.                             | 2                  | STCA, MSAW, individual and collective strategy<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ACP<br>HUM 5.1.6 | Execute corrective actions.  | 3                  | Error compensation<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ACP<br>HUM 5.1.7 | Explain the importance of error management.                                      | 2                  | <i>Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practises</i>  | ALL |
| ACP<br>HUM 5.1.8 | Describe the impact on an ATCO following an occurrence/incident.                 | 2                  | <i>Optional content: reporting, SMS, investigation, CISM</i>   | ALL |
| Subtopic         | HUM 5.2  | Violation of rules |  |     |

|                  |   |   |  |     |
|------------------|---|---|--|-----|
| ACP<br>HUM 5.2.1 | Explain the causes and dangers of violation of rules becoming accepted as a practice. | 2 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |
|------------------|---|---|--|-----|

## TOPIC HUM 6 ~~WORKING METHODS~~

| Subtopic                    | HUM 6.1  | Efficiency |   |     |
|-----------------------------|--|------------|---|-----|
| ACP<br>HUM <del>6.1.1</del> | <del>Consider, from a human factors point of view, the factors affecting efficiency in the provision of air traffic control.</del> | 2          | <del>Optional content: Own and others workload, OT, customer requirements, economy, ecology, safety</del> | ALL |

## TOPIC HUM 6 COLLABORATIVE WORK

| Subtopic                      | HUM 6.1  | Communication  |   |     |
|-------------------------------|--|--|---|-----|
| ACP<br>HUM 6.1.1<br>8.1.1     | Use communication effectively in ATC.  | 3  |   | ALL |
| ACP<br>HUM 6.1.2<br>2.1.3 ATM | Analyse examples of pilot and controller communication for effectiveness.                                    | 4  |   | ALL |
| Subtopic                      | HUM 6.2  | Collaborative work within the same area of responsibility    |   |     |
| ACP<br>HUM 6.2.1<br>8.2.1     | List communication means between controllers in charge of the same area of responsibility (sector or tower). | 1  | <i>Optional content: Electronic, written, verbal and non-verbal communication</i>     | ALL |
| ACP<br>HUM 6.2.2<br>8.2.2     | Explain consequences of the use of communication means on effectiveness.                                     | 2  | <i>Optional content: Strips legibility and encoding, labels designation, Feedback</i> | ALL |
| ACP<br>HUM 6.2.3<br>8.2.3     | List possible actions to provide a safe position handover.   | 1  | <i>Optional content: rigour, preparation, overlap time</i>                            | ALL |
| ACP<br>HUM 6.2.4<br>8.2.4     | Explain consequences of a missed position handover process.  | 2  |   | ALL |
| Subtopic                      | HUM 6.3  | Collaborative work between different areas of responsibility |   |     |
| ACP<br>HUM 6.3.1<br>8.3.1     | List factors and means for an effective coordination between sectors and/or tower positions.                 | 1  | <i>Optional content: Other sectors constraints, electronic coordination tools</i>     | ALL |
| Subtopic                      | HUM 6.4  | Controller / pilot cooperation                               |   |     |

|  |  |   |  |     |
|--|--|---|--|-----|
| ACP<br>HUM 6.4.1<br>8.4.1                            | Describe parameters affecting controller/pilot cooperation.  | 2 | <i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>                  | ALL |
| <b>TOPIC HUM 7 WORKING KNOWLEDGE</b>                 |  |   |  |     |
| <b>Subtopic HUM 7.1 Controller knowledge</b>         |  |   |  |     |
| ACP<br>HUM 7.1.1<br>1.1.2 LAW                        | Explain how to maintain and update professional knowledge to retain competence in the operational environment. | 2 | <i>Optional content: Briefing, LOAs, NOTAM, AICs, Reports of accident/incident, VOLMET, ATIS, SIGMET</i> | ALL |
| <b>TOPIC HUM 9 WORK ENVIRONMENT</b>                  |  |   |  |     |
| <b>Subtopic HUM 9.1 Ergonomics</b>                   |  |   |  |     |
| ACP<br>HUM 9.1.1                                     | <del>Appreciate the impact of working position ergonomics on controller activity.</del>                        | 3 |  | ALL |
| <b>TOPIC HUM 10 ATC SAFETY MANAGEMENT</b>            |  |   |  |     |
| <b>Subtopic HUM 10.1 Experience feedback</b>         |  |   |  |     |
| ACP<br>HUM 10.1.1<br>3.1.1 LAW                       | State the importance of the controllers contribution to the experience feedback process.                       | 1 | <i>Optional content: voluntary reporting</i>   | ALL |
| ACP<br>HUM 10.1.2<br>3.1.2 LAW                       | Describe how reported occurrences are analysed.  | 2 | <i>Optional content: ESARR2, local procedures</i>  | ALL |
| ACP<br>HUM 10.1.3<br>3.1.3 LAW                       | Name the means used to disseminate recommendations.  | 1 | <i>Optional content: Safety letters, safety boards web pages</i>   | ALL |
| ACP<br>HUM 10.1.4<br>3.1.4 LAW                       | Explain the "Just Culture" concept.  | 2 | <del>benefits, prerequisites, constraints</del><br><i>Optional content: EAM 2 GUI 6, GAIN Report</i>     | ALL |
| <b>Subtopic HUM 10.2 Safety investigation branch</b> |  |   |  |     |
| ACP<br>HUM 10.2.1<br>3.2.1 LAW                       | Describe role and mission of Safety Investigation Branch in the improvement of safety.                         | 2 |  | ALL |
| ACP<br>HUM 10.2.2<br>3.2.2 LAW                       | Define working methods of Safety Investigation Branch.   | 1 |  | ALL |

## Subject 8 : EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall ~~+~~ integrate knowledge and understanding of the basic working principles of equipment and systems and ~~it~~ comply with the equipment and system degradation procedures in the provision of ATS.

### TOPIC EQPS 1 VOICE COMMUNICATIONS

| Subtopic          | EQPS 1.1   | Radio communications       |  |                          |
|-------------------|--|----------------------------|--|--------------------------|
| ACP<br>EQPS 1.1.1 | Operate two-way communication equipment.                       | 3                          | Transmit/receive switches, Procedures<br><i>Optional content: Frequency selection, Standby equipment</i>                                       | ALL                      |
| ACP<br>EQPS 1.1.2 | Identify indications of operational status of radio equipment. | 3                          | <i>Optional content: Indicator lights, Serviceability displays, Selector/frequency displays</i>  | ALL                      |
| ACP<br>EQPS 1.1.3 | Consider radio range.  | 2                          | <i>Optional content: Transfer to another frequency, Apparent radio failure, Failure to establish radio contact, Frequency protection range</i> | APP<br>ACP<br>APS<br>ACS |
| Subtopic          | EQPS 1.2   | Other voice communications |  |                          |
| ACP<br>EQPS 1.2.1 | Operate landline communications.                               | 3                          | <i>Optional content: telephone, interphone and intercom equipment</i>  | ALL                      |

### TOPIC EQPS 2 AUTOMATION IN ATS

| Subtopic          | EQPS 2.1   | Aeronautical fixed telecommunication network (AFTN) |  |            |
|-------------------|--|---|--|------------|
| ACP<br>EQPS 2.1.1 | Decode AFTN messages.                                  | 3   | Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.     | ALL        |
| Subtopic          | EQPS 2.2   | Automatic data Interchange                          |  |            |
| ACP<br>EQPS 2.2.1 | Use automatic data transfer equipment where available. | 3   | Optional content: Sequencing systems, Automated information and coordination, OLDI | APP<br>ACP |

### TOPIC EQPS 3 CONTROLLER WORKING POSITION

| Subtopic          | EQPS 3.1  | Operation and monitoring of equipment |  |     |
|-------------------|---|---------------------------------------|--|-----|
| ACP<br>EQPS 3.1.1 | Monitor the technical integrity of the controller working position. | 3                                     | Notification procedures, Responsibilities  | ALL |
| ACP<br>EQPS 3.1.2 | Operate the equipment of the controller working position.           | 3                                     | Optional content: Situation displays, Flight progress board, Flight data display, Radio, Telephone, Maps and charts, Strip-printer, Clock, Information <i>systems monitors</i> , <del>(ECIS)</del> , UDF/VDF | ALL |



|   |  |   |   |                          |
|---|--|---|---|--------------------------|
| ACP<br>EQPS 3.1.3   | Operate <del>at</del> available equipment in unusual/degraded/abnormal and emergency situations. | 3 |   | ALL                      |
| <b>Subtopic EQPS 3.2 Situation displays and information systems</b>   |  |   |   |                          |
| ACP<br>EQPS 3.2.1   | Use situation displays.  | 3 |   | ALL                      |
| ACP<br>EQPS 3.2.2   | Check availability of information material.  | 3 |   | ALL                      |
| ACP<br>EQPS 3.2.3   | Obtain information from equipment.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic EQPS 3.3 Flight data systems</b>                          |  |   |   |                          |
| ACP<br>EQPS 3.3.1   | Use the flight data information at controller working position.                                  | 3 |   | ALL                      |
| <b>TOPIC EQPS 4 FUTURE EQUIPMENT</b>                                  |  |   |   |                          |
| <b>Subtopic EQPS 4.1 New developments</b>                             |  |   |   |                          |
| ACP<br>EQPS 4.1.1   | Recognise future developments.   | 1 | New advanced systems  | ALL                      |
| <b>TOPIC EQPS 5 EQUIPMENT AND SYSTEMS LIMITATIONS AND DEGRADATION</b> |  |   |   |                          |
| <b>Subtopic EQPS 5.1 Reaction to limitations</b>                      |  |   |   |                          |
| ACP<br>EQPS 5.1.1   | Take account of the limitations of equipment and systems.  | 2 |   | ALL                      |
| ACP<br>EQPS 5.1.2   | Respond to technical deficiencies of the operational position.                                   | 3 | Notification procedures, Responsibilities   | ALL                      |
| <b>Subtopic EQPS 5.2 Communication equipment degradation</b>          |  |   |   |                          |
| ACP<br>EQPS 5.2.1   | Identify that communication equipment has degraded.  | 3 | Optional content: Ground-air and landline communications  | APP<br>ACP<br>APS<br>ACS |
| ACP<br>EQPS 5.2.2   | Integrate contingency procedures in the event of communication equipment degradation.            | 3 | Procedures for total or partial degradation of ground-air and landline communications, Alternative methods of transferring data | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic EQPS 5.3 Navigational equipment degradation</b>           |  |   |   |                          |

|                   |  |   |  |                                 |
|-------------------|--|---|--|---------------------------------|
| ACP<br>EQPS 5.3.1 | Identify when a navigational equipment failure will affect operational ability.        | 3 | <i>Optional content: VOR, Navigational aids</i>  | ALL                             |
| ACP<br>EQPS 5.3.2 | Integrate contingency procedures in the event of a navigational equipment degradation. | 3 | <i>Optional content: Vertical separation, Information to aircraft, Navigational assistance, Seeking assistance from adjacent units</i> | ADI<br>APP<br>ACP<br>APS<br>ACS |

## Subject 9 : PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

| TOPIC                     | PEN 1   | FAMILIARISATION PROFESSIONAL ENVIRONMENT                                  |   |            |
|---------------------------|---|---|---|------------|
| Subtopic                  | PEN 1.1   | Study visit to area control centre  |   |            |
| ACP<br>PEN 1.1.1          | Appreciate the functions and provision of an operational area control service.  | 3   | study visit to area control centre  | ACP<br>ACS |
| TOPIC                     | PEN 2   | AIRSPACE USERS  |   |            |
| Subtopic                  | PEN 2.1   | Contributors to civil ATS operations                                      |   |            |
| ACP<br>PEN 2.1.1<br>1.1.1 | Characterise civil <del>and military</del> ATS activities in area control centre.   | 2   | Study visit to an area control centre<br><br><i>Optional content: Familiarisation visits to e.g. TWR, APP, ACC, AIS, RCC, Air Defence Units</i>   | ACP<br>ACS |
| ACP<br>PEN 2.1.2<br>1.1.2 | Characterise other parties interfacing with ATS operations.   | 2   | <i>Optional content: familiarisation visits to engineering services, fire and emergency services, airline operations offices</i>  | ALL        |
| Subtopic                  | PEN 2.2   | Contributors to military ATS operations                                   |   |            |
| ACP<br>PEN 2.2.1<br>1.1.1 | Characterise <del>civil and</del> military ATS activities.  | 2   | <i>Optional content: Familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units</i>   | ALL        |
| TOPIC                     | PEN 3   | CUSTOMER RELATIONS  |   |            |
| Subtopic                  | PEN 3.1   | <del>Customer relations</del> Provision of services and user requirements |   |            |
| ACP<br>PEN 3.1.1<br>1.2.1 | Identify the role of ATC as a service provider. <del>and the requirements of the ATS users.</del>   | 3   | <del>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</del>  | ALL        |
| ACP<br>PEN 3.1.2<br>1.2.1 | Appreciate ATS users requirements.  | 3   | <del>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</del>  | ALL        |
| TOPIC                     | PEN 4   | ENVIRONMENTAL PROTECTION  |   |            |
| Subtopic                  | PEN 4.1   | Environmental protection  |   |            |
| ACP<br>PEN 4.1.1<br>1.3.1 | Appreciate the mitigation techniques used en-route to minimise the aviation's impact on the environment. <del>Describe processes used to ensure environmental protection.</del> | 3   | <i>Optional content: FRA, night/weekend routes curfews, relations with local community, relations with environmental associations, relevant administrations<br/>ICAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions</i> | ACP<br>ACS |

## Subject 10: ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in ~~unusual, degraded~~-abnormal and emergency situations.

### TOPIC ABES 1 ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS (ABES)

| Subtopic                        | ABES 1.1  | Overview of <del>UNDES</del> ABES |   |                          |
|---------------------------------|---|-----------------------------------|---|--------------------------|
| ACP<br>ABES 1.1.1               | List common <del>unusual/degraded</del> -abnormal and emergency situations.   | 1                                 | Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, <del>GPWS</del> ground based safety nets alerts, airframe failure, unreliable instruments, runway incursion | ALL                      |
| ACP<br>ABES 1.1.2<br>4.1.2 ACFT | Identify potential or actual abnormal and emergency situations.   | 3                                 |   | ALL                      |
| ACP<br>ABES 1.1.3<br>1.1.2      | Take into account the procedures for given <del>unusual/degraded</del> -abnormal and emergency situations.            | 2                                 | Optional content: ICAO Doc 4444   | APP<br>ACP<br>APS<br>ACS |
| ACP<br>ABES 1.1.4<br>1.1.3      | Take into account that procedures don't exist for all <del>unusual/degraded</del> -abnormal and emergency situations. | 2                                 | Optional content: real life examples  | ALL                      |
| ACP<br>ABES 1.1.5<br>1.1.4      | Consider how the evolution of a situation may have an impact on safety.   | 2                                 | Optional content: Separation, Information, Coordination   | ALL                      |

### TOPIC ABES 2 SKILLS IMPROVEMENT

| Subtopic          | ABES 2.1   | Communication effectiveness  |   |     |
|-------------------|--|------------------------------|---|-----|
| ACP<br>ABES 2.1.1 | Ensure effective communication in all circumstances including the case where standard phraseology is not applicable. | 4                            | Phraseology, Vocabulary, Readback, Silence instruction                        | ALL |
| ACP<br>ABES 2.1.2 | Apply change of radiotelephony call sign.  | 3                            | ICAO Doc 4444   | ALL |
| Subtopic          | ABES 2.2   | Avoidance of mental overload |   |     |
| ACP<br>ABES 2.2.1 | Describe actions to keep the control of the situation.   | 2                            | Optional content: sector splitting, holding, flow management, task delegation | ALL |
| ACP<br>ABES 2.2.2 | Organise priority of actions.  | 4                            |   | ALL |

|   |  |   |   |     |
|---|--|---|---|-----|
| ACP<br>ABES 2.2.3   | Ensure an effective circulation of information.  | 4 | <i>Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.</i>                                 | ALL |
| ACP<br>ABES 2.2.4   | Consider asking for help.  | 2 |   | ALL |
| <b>Subtopic ABES 2.3 Air / ground cooperation</b>                                     |  |   |   |     |
| ACP<br>ABES 2.3.1   | Collect appropriate information relevant for the situation.  | 3 |   | ALL |
| ACP<br>ABES 2.3.2   | Assist the pilot.  | 3 | <b>Pilot workload</b><br><i>Optional content: Instructions, information, support, human factors, etc.</i>   | ALL |
| <b>TOPIC ABES 3 PROCEDURES FOR UNUSUAL/DEGRADED/ABNORMAL AND EMERGENCY SITUATIONS</b> |  |   |   |     |
| <b>Subtopic ABES 3.1 Application of procedures for UNDES ABES</b>                     |  |   |   |     |
| ACP<br>ABES 3.1.1   | Apply the procedures for given <del>unusual/degraded</del> abnormal and emergency situations.          | 3 | <i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, GPWS ground based safety nets alerts, airframe failure</i> | ALL |
| <b>Subtopic ABES 3.2 Radio failure</b>  |  |   |   |     |
| ACP<br>ABES 3.2.1   | Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure. | 2 | <b>ICAO Doc 7030</b><br><i>Optional content: military procedures</i>  | ALL |
| ACP<br>ABES 3.2.2   | Apply the procedures to be followed when a pilot experiences complete or partial radio failure.        | 3 | <i>Optional content: Prolonged loss of communication</i>  | ALL |
| <b>Subtopic ABES 3.3 Unlawful interference and aircraft bomb threat</b>               |  |   |   |     |
| ACP<br>ABES 3.3.1   | Apply ATC procedures associated with unlawful interference and aircraft bomb threat.                   | 3 | <b>ICAO Doc 4444</b>  | ALL |
| <b>Subtopic ABES 3.4 Strayed or unidentified aircraft</b>                             |  |   |   |     |
| ACP<br>ABES 3.4.1   | Apply the procedures in the case of strayed aircraft.  | 3 | <b>ICAO Doc 4444</b><br><i>Optional content: Inside controlled airspace, Outside controlled airspace</i>  | ALL |
| ACP<br>ABES 3.4.2   | Apply the procedures in the case of unidentified aircraft.   | 3 | <b>ICAO Doc 4444</b>  | ALL |

| Subtopic ABES 3.5 Diversions |  |  |                          |
|------------------------------|--|--|--------------------------|
| ACP<br>ABES 3.5.1            | Provide navigational assistance to diverting emergency aircraft. | 4 Track/heading, Distance, Other navigational assistance<br><i>Optional content: Nearest most suitable aerodrome</i> | APP<br>ACP<br>APS<br>ACS |

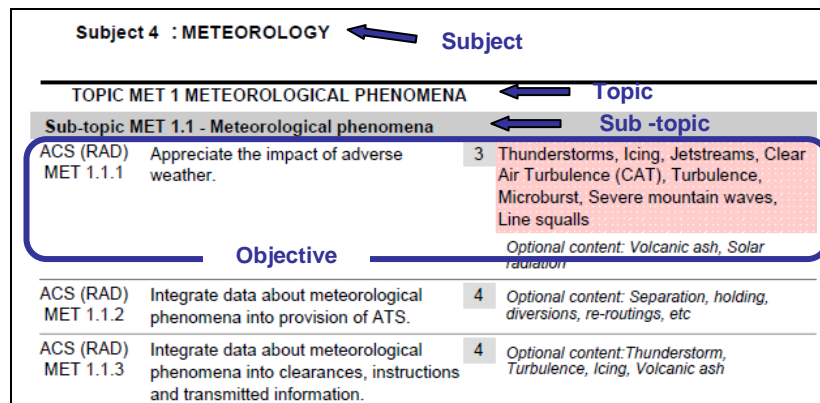
## Supplements

## Supplement 1

### SYLLABI STRUCTURE - HOW TO READ THE TABLES

#### 1. Structure of the Rating training syllabi

- a. Each Rating training has been structured as a syllabus, as follows:
  - i. Each syllabus is divided into subjects, which are divided into topics that are in turn divided into sub-topics. This structure is used to create and classify the objectives. There can be one or several objectives linked to each sub-topic.
  - ii. Objectives are assigned to a specific subject which deals with the knowledge and skills needed to accomplish the subject objective contained in Appendix 7 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(iv) Area Control Procedural Rating — ACP)



**Figure 1: Layout of syllabus**

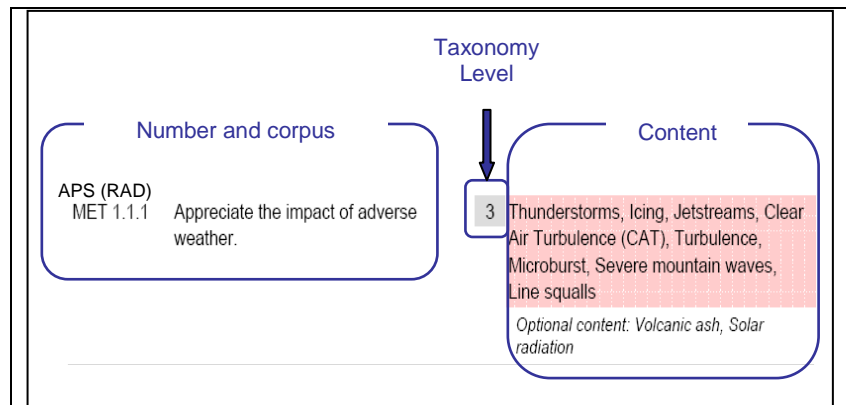
- b. The following principles may be applied to the development of a training course that is based on any of the syllabi:
  - i. The structure of the syllabi and the order of the objectives contained within Appendix 7 to Regulation (EU) No .../... is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.
  - ii. No objective from the Basic syllabus is repeated as 'a refresher' in the Rating syllabi.
  - iii. The number of objectives contained within a sub-topic does not necessarily signify how long it should take to teach that sub-topic. For example, a sub-topic containing five relatively straightforward objectives, may take a shorter time to be taught than another sub-topic containing two complex objectives.

#### 2. Structure of objectives

- a. An objective consists of three elements:
  - i. The corpus, which is a description of the required performance. It always contains an action verb to ensure that the outcome is observable. The action verb is always associated with a defined taxonomy.



- ii. The level, which indicates numerically the taxonomy of the action verb.
- iii. The content, which may be implicit or explicit. The explicit content is written in the content field, while the implicit content is not but, instead, is implied in the corpus of the objective and other elements (syllabus, subject, etc.). Content that is a required part of the objective is written in the red shaded field. Optional content, written in italics, may be used if considered appropriate.



**Figure 2: Layout of an objective**

### 3. Repeated and common objectives

- a. Repeated and common objectives are only applicable to Rating training.
- b. To the right of each objective there is an indication of which other ratings contain this particular objective. This indication is the first step to help the training providers in identifying the potential commonalities between the various syllabi. As a second step, the training provider must determine, at the level of local implementation, whether the objective is to be regarded as repeated or common.

| TOPIC MET 1 - METEOROLOGICAL PHENOMENA      |  |   |   |                          |
|---|--|---|---|--------------------------|
| Subtopic MET 1.1 - Meteorological phenomena |  |   |   |                          |
| APS<br>MET 1.1.1                            | Appreciate the impact of adverse weather.                            | 3 | Thunderstorms, Icing, Clear Air Turbulence (CAT), Turbulence, Microburst, Wind shear, Severe mountain waves, Line squalls, Volcanic ash | APP<br>APS               |
| APS<br>MET 1.1.2                            | Integrate data about meteorological phenomena into provision of ATS. | 4 | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena</i>                      | ALL                      |
| APS<br>MET 1.1.3                            | Use techniques to avoid adverse weather when necessary/possible.     | 3 | Rerouting, level change, etc.   | APP<br>ACP<br>APS<br>ACS |

**Figure 3: Indication of the ratings that particular objective applies to.**

### 3.1 Repeated objectives

- a. All the objectives appearing in a syllabus are implicitly appropriate to this syllabus. As a consequence, objectives may be repeated 'verbatim' in different rating syllabi and nevertheless specify a different performance. The reader always needs to mentally add the sentence 'in this syllabus context' at the end of each objective.

*For example, the objective 'use approved phraseology' is repeated (same level, same corpus, same content) in all the syllabi but is different because the context is different in each syllabus (a learner able to use approved phraseology for en-route traffic will need additional training before mastering the phraseology in the provision of aerodrome control).*

### 3.2 Common objectives

- a. Common objectives are verbatim the same objectives that appear in more than one rating syllabi in the same context so that they do not need to be taught again in case of combined or successively organised courses.

*For example, the objective 'describe the human information processing model' is common for all the syllabi because the context is non-specific and is therefore not determined by the type of rating.*

- b. As a general principle, the rating subject Human Factors is identical in each Rating training syllabi and can be considered as containing common objectives because the context is always the same. This means that the rating training objectives relating to Human Factors need only be taught once. If a learner is acquiring an additional rating, he/she would not be required to repeat the Human Factors objectives.

#### 4. Action verbs that support the Taxonomy for training objectives:

- a. The five taxonomy levels should be understood to have the following levels of complexity:
- b. Action verbs for Level 1

Level 1 - A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

| L1 Verb          | Definition   | Example  |
|------------------|--|--|
| <b>Define</b>    | State what it is and what its limits are; state the definition | Define ATC service   |
| <b>Draw</b>      | Produce a picture, pattern or diagram                          | Draw the block diagram<br>Draw a holding pattern   |
| <b>List</b>      | Say one after the other  | List the main structure components of an aircraft  |
| <b>Name</b>      | Give name of objects or procedures                             | Name the components of an ILS<br>Name the key national and international aviation organisations. |
| <b>Quote</b>     | Repeat of what is written or said to underline                 | Quote ICAO definition of ATC service   |
| <b>Recognise</b> | To know what it is because you've seen it before               | Recognise the information contained in the different parts of the AIP.                           |
| <b>State</b>     | Say or write in a formal or definite way                       | State the meteorological hazards to aviation.  |

#### c. Action verbs for Level 2

Level 2 - The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

| L2 Verb              | Definition  | Example   |
|----------------------|---|---|
| <b>Characterise</b>  | To describe the quality of features in something                                  | Characterise the main items of ATC equipment                            |
| <b>Consider</b>      | To think carefully about it   | Consider the benefits of Critical Incident Stress Management (CISM).    |
| <b>Demonstrate</b>   | Describe and explain; logically or mathematically proves the truth of a statement | Demonstrate the importance of good communications in ATC.               |
| <b>Describe</b>      | Say what it is like or what happened  | Describe the methods by which ICAO notifies and implements legislation. |
| <b>Differentiate</b> | Show the differences  | Differentiate between different   |

|                        |   |  |
|------------------------|---|--|
|                        | between things  | types of visibility.   |
| <b>Explain</b>         | Give details about something or describe so that it can be understood | Explain the purpose and function of ICAO   |
| <b>Take account of</b> | Take into consideration before deciding                               | Take into account the wind influence when calculating a ground speed.<br>Take account of the limitations of equipment and systems. |

## d. Action verbs for Level 3

Level 3 - A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

| L3 Verb           | Definition  | Example  |
|-------------------|---|--|
| <b>Act</b>        | Carry out, execute  | Act to reduce stress.  |
| <b>Apply</b>      | Use something in a situation or activity  | Apply separation.  |
| <b>Appreciate</b> | To understand a situation and know what is involved in a problem-solving situation, to state a plan without applying it                                 | Appreciate the necessity for coordination. (The learner says that the coordination will be done and with whom, he/she does not perform the actual coordination). |
| <b>Assist</b>     | Help somebody to do a job by doing part of it   | Assist the pilot   |
| <b>Calculate</b>  | To discover from information you already have by arithmetic; to think about a possible cause of action in order to form an opinion or decide what to do | Calculate appropriate levels<br>Calculate conversions between the three north designations.  |
| <b>Check</b>      | Make sure the information is correct (satisfactory)   | Check the accuracy of flight data information<br>Check availability of information material.   |
| <b>Choose</b>     | Select out of number, decide to do one thing rather than another  | Choose appropriate levels.<br>Choose which aircraft should be vectored   |
| <b>Collect</b>    | Assemble, accumulate, bring or come together  | Collect examples of different types of error, their causes and consequences in ATC.  |
| <b>Conduct</b>    | Lead, guide   | Conduct coordination   |
| <b>Confirm</b>    | Establish more firmly, corroborate  | Confirm sequence order   |
| <b>Decode</b>     | Turn into ordinary writing, decipher  | Decode the content of weather reports and forecast   |
| <b>Encode</b>     | Put into code or cipher   | Encode and decode flight plans (including supplementary information).  |
| <b>Estimate</b>   | Form an approximate judgement of a number, form an opinion  | Estimate distance and direction between two points   |
| <b>Execute</b>    | Perform action  | Execute corrective actions.  |
| <b>Extract</b>    | Copy out, make extracts from, find, deduce  | Extract pertinent data from relevant sources to produce a flight progress  |

| L3 Verb         | Definition  | Example   |
|-----------------|---|---|
|                 |   | display.  |
| <b>Identify</b> | Associate oneself inseparably with, establish the identity  | Identify the role of ATC as a service provider and the requirements of the ATS users.<br>Identify an aircraft |
| <b>Inform</b>   | Inspire, tell   | Inform supervisor of situation.   |
| <b>Initiate</b> | Begin, set going, originate   | Initiate appropriate coordination   |
| <b>Input</b>    | Enter in the system   | Input data  |
| <b>Issue</b>    | Send forth, publish   | Issue appropriate ATC clearances.<br>Issue appropriate traffic information.                                   |
| <b>Maintain</b> | Carry on, keep up, refresh  | Maintain flight data display  |
| <b>Measure</b>  | Ascertain extent or quality of (thing) by comparison with fixed unit or with object of known size | Measure distance on a map   |
| <b>Monitor</b>  | Keep under observation  | Monitor traffic<br>Monitor the effect of human information processing factors on decision making.             |
| <b>Notify</b>   | Make known, announce, report  | Notify runway in use  |
| <b>Obtain</b>   | Acquire easily, without research  | Obtain meteorological information<br>Obtain information from the relieving controller.                        |
| <b>Operate</b>  | Conduct work on equipment   | Operate the equipment of the controller working position.   |
| <b>Pass</b>     | Move, cause to go, transmit   | Pass essential traffic information without delay  |
| <b>Perform</b>  | Carry into effect, go through, execute  | Perform communication effectively   |
| <b>Process</b>  | To put through the steps of a prescribed procedure  | Process pertinent data on data displays.  |
| <b>Record</b>   | Register, set down for remembrance or reference   | Record information by writing effectively   |
| <b>Relay</b>    | Arrange in, provide with, replace by ...  | Relay meteorological information from pilot reports.  |
| <b>Respond</b>  | Make answer, perform answering or corresponding action  | Respond to loss/doubt concerning identification.<br>Respond to distress and urgency messages and signals.     |
| <b>Scan</b>     | Continuously observe rapidly, sequentially and selectively in order to                            | Scan data display   |

| L3 Verb         | Definition   | Example  |
|-----------------|--|--|
|                 | extract relevant data  |  |
| <b>Transfer</b> | Hand over  | Transfer information to the relieving controller                       |
| <b>Update</b>   | Refresh, bring up-to-date                                      | Update the data display to accurately reflect the traffic situation.   |
| <b>Use</b>      | Employ for a purpose, handle as instrument, put into operation | Use approved phraseology.<br>Use the available means for coordination. |
| <b>Verify</b>   | Establish truth of   | Verify the mode C information  |

## e. Action verbs for Level 4

Level 4 - Ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problem situation. This involves the integration of known applications in a familiar situation.

| L4 Verb           | Definition   | Example   |
|-------------------|--|---|
| <b>Acquire</b>    | Gain by oneself and for oneself, obtain after research | Acquire relevant aeronautical information   |
| <b>Adjust</b>     | Change to a new position, value or setting             | Adjust the surveillance system display  |
| <b>Allocate</b>   | Assign, devote   | Allocate levels (height, altitude, flight level) according to altimetry data.   |
| <b>Analyse</b>    | Examine minutely the constitution of                   | Analyse examples of pilot and controller communication for effectiveness.<br>Analyse the information provided by the radar equipment. |
| <b>Assign</b>     | Allot as a share, make over                            | Assign codes.   |
| <b>Coordinate</b> | Bring part into proper relation                        | Coordinate runway in use.<br>Coordinate in the provision of FIS.  |
| <b>Comply</b>     | Act in accordance with                                 | Comply with rules   |
| <b>Delegate</b>   | Commit authority to somebody                           | Delegate separation to pilots in the case of aircraft executing successive visual approaches.   |
| <b>Detect</b>     | Discover existence of                                  | Detect potential conflict   |
| <b>Ensure</b>     | Make safe, make certain                                | Ensure the agreed course of action is carried out   |
| <b>Expedite</b>   | Assist the progress of, do speedily                    | Expedite traffic  |
| <b>Integrate</b>  | Combine into a whole, complete by addition of          | Integrate appropriate ATC clearances in control service.  |

| L4 Verb         | Definition  | Example  |
|-----------------|---|--|
|                 | parts   |  |
| <b>Manage</b>   | Handle, wield, conduct                                      | Manage traffic on the manoeuvring area.<br>Manage traffic in accordance with procedural changes. |
| <b>Organise</b> | Give orderly structure to, frame and put into working order | Organise pertinent data on data displays.<br>Organise priority of actions.                       |
| <b>Predict</b>  | Forecast  | Predict positions of aircraft in the aerodrome traffic and taxi circuits.                        |
| <b>Provide</b>  | Supply, furnish   | Provide radar separation.<br>Provide FIS.  |
| <b>Relate</b>   | Establish link with   | Relate a pressure setting to an altitude   |

## f. Action verbs for Level 5

Level 5 - Ability to analyse new situation in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different from those previously met, requiring judgement and evaluation of options.

| L5 verb          | Definition   | Example   |
|------------------|--|---|
| <b>Assess</b>    | Estimate value or difficulty, evaluate, appraise                                     | Assess workload   |
| <b>Balance</b>   | Weigh (a question, two arguments, etc., against each other)                          | Balance the workload with the traffic demand.   |
| <b>Discuss</b>   | Investigate by reasoning or argument   | Discuss the impact of regulation.   |
| <b>Evaluate</b>  | Ascertain amount of, find numerical expression for                                   | Evaluate the necessary information to be provided to pilots in need of navigational assistance. |
| <b>Interpret</b> | To decide on something's meaning or significance when there is a choice              | Interpret operational information.  |
| <b>Optimise</b>  | To make optimal; get the most out of; use best; modify to achieve maximum efficiency | Optimise the use of support tools.  |
| <b>Resolve</b>   | Solve, clear up, settle  | Resolve conflict  |
| <b>Select</b>    | Pick out as best or most suitable  | Select the runway in use  |
| <b>Theorise</b>  | Extract general principles from a particular experience                              | Theorise the resolution of conflict between a slow and a fast aircraft                          |



| L5 verb         | Definition   | Example   |
|-----------------|--|---|
| <b>Validate</b> | Make valid, ratify, prove valid, show or confirm the validity of something | Validate one radar vectoring option to expedite the traffic |

g. Application of taxonomy levels to practically-based objectives

- i. Objectives at taxonomy level 3 or higher, which are of a practical nature, related to all subjects except ATM, may be achieved by any suitable type of practical training methods e.g. hands on, plotting on charts, etc.
  - ii. Objectives at taxonomy level 3 or higher, for the ATM subject (Basic and Rating), are practical by nature and require the integration of several knowledge areas and skills at the same time, e.g. vectoring of an aircraft requires knowledge and skills in the areas of radio telephony, aircraft performance, navigation and radar theory. Therefore, ATM level 3 objectives should be achieved through the use of a part task trainer or a simulator.
  - iii. ATM level 4 objectives should be achieved for the most part through the use of a simulator. A part task trainer, which presents operational situations at an enforced pace, may be used to achieve some ATM level 4 objectives.
  - iv. ATM level 5 objectives should be achieved through the use of a simulator.
-

## Supplement 2

### Abbreviations

For the purposes of these AMCs, the following abbreviations and acronyms shall apply:

| Abbreviation | Meaning  |
|--------------|--|
| ABAS         | Aircraft-based Augmentation System (EGNOS)   |
| ACAS         | Airborne Collision Avoidance System  |
| ACC          | Area Control Centre  |
| ACP          | Area Control Procedural Rating   |
| ACFT         | Aircraft (subject)   |
| ACN          | Aircraft Classification Number   |
| ACS          | Area Control Surveillance Rating   |
| ADF          | Automatic Direction Finding System   |
| ADI          | Aerodrome Control Instrument   |
| ADS          | Automatic Dependent Surveillance   |
| ADV          | Aerodrome Control Visual Rating  |
| ADVS         | Advisory Service   |
| AEA          | Association of European Airlines   |
| AFIL         | Air Filed Flight Plan  |
| AFTN         | Aeronautical fixed telecommunication network   |
| AGA          | Aerodromes   |
| AIC          | Aeronautical Information Circular  |
| AIP          | Aeronautical Information Publication   |
| AIRAC        | Aeronautical Information Regulation and Control  |
| AIRAC SUP    | AIRAC Supplement   |
| AIREP        | Air-Report   |
| AIRMET       | Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations |
| AIS          | Aeronautical Information Service   |
| ALRS         | Alerting Service   |
| AMC          | Acceptable Means of Compliance   |
| APM          | Approach Path Monitor  |
| APP          | Approach Control / Centre / Procedural Rating  |
| APS          | Approach Control Surveillance Rating   |
| APV          | Approach Procedure with Vertical guidance  |
| APW          | Area Proximity Warning   |
| ASDA         | Accelerate Stop Distance Available   |
| ASM          | Airspace Management  |

|         |  |
|---------|--|
| ASMGCS  | Advanced Surface Movement Guidance and Control Systems               |
| ATC     | Air Traffic Control  |
| ATCEUC  | Air Traffic Controllers European Unions Co-ordination                |
| ATCO    | Air Traffic Controller   |
| ATCS    | Air Traffic Control Service  |
| ATFCM   | Air Traffic Flow and Capacity Management                             |
| ATFM    | Air Traffic Flow Management  |
| ATIS    | Automatic Terminal Information Service                               |
| ATM     | Air Traffic Management   |
| ATS     | Air Traffic Services   |
| ATZ     | Aerodrome Traffic Zone   |
| AVASI   | Advanced Visual Approach Slope Indicator                             |
| B-RNAV  | Basic Area Navigation  |
| BIRDTAM | Bird hazard NOTAM (NOTAM reporting bird hazard)                      |
| CANSO   | Civil Air Navigation Services Organisation                           |
| CAT     | Clear Air Turbulence   |
| CBA     | Cross Border Area  |
| CBT     | Computer Based Training  |
| CCIS    | Closed Circuit Information System                                    |
| CDR     | Conditional Route  |
| CISM    | Critical Incident Stress Management                                  |
| CPDLC   | Controller Pilot Data Link Communications                            |
| CPL     | Current Flight Plan  |
| D-GPS   | Differential Global Positioning System                               |
| DFTI    | Distance from Touchdown Indicator                                    |
| DME     | Distance Measuring Equipment   |
| Doc     | Document   |
| EAM     | ESARR Advisory Material  |
| EASA    | European Aviation Safety Agency                                      |
| EAT     | Expected Approach Time   |
| EATCHIP | European Air Traffic Control Harmonisation and Integration Programme |
| EATMP   | European Air Traffic Management Programme                            |
| EC      | European Commission  |
| ECAC    | European Civil Aviation Conference                                   |
| EET     | Estimated Elapsed Time   |
| EFIS    | Electronic Flight Instrument System                                  |
| EGNOS   | European Geostationary Overlay Service                               |
| EQPS    | Equipment and Systems (subject)                                      |

|             |  |
|-------------|--|
| ESARR       | Eurocontrol Safety Regulatory Requirements                       |
| ETF         | European Transport Workers' Federation                           |
| EUROCONTROL | European Organisation for the Safety of Air Navigation           |
| FAB         | Functional Airspace Block  |
| FDPS        | Flight Data Processing System                                    |
| FIR         | Flight Information Region  |
| FIS         | Flight Information Service                                       |
| FMS         | Flight Management System   |
| FPB         | Flight Progress Board  |
| FPL         | Flight Plan  |
| FUA         | Flexible Use of Airspace   |
| GAIN Report | Global Aviation Information Network Report                       |
| GBAS        | Ground Based Augmentation System                                 |
| GLONASS     | Global Orbiting Navigation Satellite System                      |
| GNSS        | Global Navigation Satellite System                               |
| GP          | Glide Path   |
| GPS         | Global Positioning System  |
| GPWS        | Ground Proximity Warning System                                  |
| GUI         | Guidelines   |
| HBK         | Handbook   |
| HF          | High Frequency   |
| HUM         | Human Factors (subject)  |
| IACA        | International Air Carrier Association                            |
| IAOPA       | International Council of Aircraft Owner and Pilot Associations   |
| IATA        | International Air Transport Association                          |
| ICAO        | International Civil Aviation Organisation                        |
| IFALPA      | International Federation of Airline Pilots Association           |
| IFATCA      | International Federation of Air Traffic Controllers Associations |
| IFPS        | Integrated Initial Flight Plan Processing System                 |
| IFR         | Instrument Flight Rules  |
| ILS         | Instrument Landing System  |
| IMC         | Instrument Meteorological Conditions                             |
| INS         | Inertial Navigation System                                       |
| INTR        | Introduction to the course (subject)                             |
| IRS         | Inertial Reference System  |
| IRVR        | Instrument Runway Visual Range                                   |
| ISA         | International Standard Atmosphere                                |
| ITU         | International Telecommunications Union                           |

|        |   |
|--------|---|
| LAW    | Aviation Law (subject)  |
| LDA    | Landing Distance Available  |
| LLZ    | Localizer   |
| LNAV   | Lateral Navigation  |
| LOA    | Letter of Agreement   |
| LPV    | Lateral Precision with Vertical guidance approach   |
| MET    | Meteorology   |
| METAR  | Meteorological Aviation Routine Weather Report  |
| MLS    | Microwave Landing System  |
| Mode A | SSR identification code   |
| Mode C | SSR Mode C (Pronounced: Mode Charlie)   |
| Mode S | Mode Select   |
| MONA   | Monitoring Aids   |
| MSAW   | Minimum Safe Altitude Warning   |
| MTCD   | Medium Term Conflict Detection  |
| MWO    | Meteorological Watch Office   |
| NAV    | Navigation (subject)  |
| NAVAID | Navigation(al) Aid  |
| NDB    | Non-Directional Beacon  |
| No.    | Number  |
| NOTAM  | Notice to Airmen  |
| OJT    | On the Job Training   |
| OLDI   | On-Line Data Interchange  |
| P-RNAV | Precision Area Navigation   |
| PANS   | Procedures for Air Navigation Services  |
| PAPI   | Precision Approach Path Indicator   |
| PAR    | Precision Approach Radar  |
| PBN    | Performance Based Navigation  |
| PCN    | Pavement Classification Number  |
| PEN    | Professional Environment (subject)  |
| PSR    | Primary Surveillance Radar  |
| PTP    | Part Time Practice  |
| QDM    | Magnetic Heading  |
| QDR    | Magnetic Bearing  |
| QFE    | Atmospheric pressure at aerodrome elevation   |
| QNH    | Atmospheric pressure at mean sea level  |
| QTF    | The position of the transmitting station according to the bearings taken by the D/F station |
| RAIM   | Receiver Autonomous Integrity Monitoring  |

|               |   |
|---------------|---|
| RCC           | Rescue Coordination Centre                                  |
| RDPS          | Radar Data Processing System                                |
| RNAV          | Area Navigation   |
| RNP           | Required Navigation Performance                             |
| RNP-RNAV      | Required Navigation Performance-Area Navigation             |
| ROC           | Rate of Climb   |
| RPL           | Stored Flight Plan  |
| RTF           | Radio Telephony   |
| RVR           | Runway Visual Range   |
| RVSM          | Reduced Vertical Separation Minimum                         |
| SADIS         | Satellite Distribution of World Area Forecast System        |
| SAR           | Search and Rescue   |
| SARPs         | Standards and Recommended Practices (ICAO)                  |
| SBAS          | Satellite Based Augmentation System                         |
| SELCAL        | Selective Calling   |
| SERA          | Standardised European Rules of the Air                      |
| SHELL (model) | Software, Hardware, Environment, Live ware, Live ware Model |
| SID           | Standard Instrument Departure (Route)                       |
| SIGMET        | Significant Meteorological Information                      |
| SMR           | Surface Movement Radar                                      |
| SNOWTAM       | NOTAM on SNOW conditions                                    |
| SPECI         | Aviation Selected Special Weather Report                    |
| SRC           | Safety Regulation Commission                                |
| SRU           | Safety Regulation Unit                                      |
| SSR           | Secondary Surveillance Radar                                |
| STCA          | Short Term Conflict Alert                                   |
| SVFR          | Special Visual Flight Rules Flight                          |
| TACAN         | UHF Tactical Air Navigation Aid                             |
| TAF           | Terminal Area (Aerodrome) Forecast                          |
| TCAC          | Tropical Cyclone Advisory Centre                            |
| TODA          | Take Off Distance Available                                 |
| TORA          | Take Off Run Available                                      |
| TRM           | Team Resource Management                                    |
| TSA           | Temporary Segregated Area                                   |
| TWR           | Tower Control Unit (Aerodrome Control Tower)                |
| UDES          | Unusual Degraded Emergency Situations                       |
| UDF           | Ultra High Frequency Direction Finder                       |
| UHF           | Ultra High Frequency  |

|        |  |
|--------|--|
| UTC    | Coordinated Universal Time               |
| VAAC   | Volcanic Ash Advisory Centre             |
| VASI   | Visual Approach Slope Indicator          |
| VDF    | Very High Frequency Direction Finder     |
| VFR    | Visual Flight Rules                      |
| VHF    | Very High Frequency                      |
| VMC    | Visual Meteorological Conditions         |
| VNAV   | Vertical Navigation                      |
| VOLMET | Routine Weather Reports Broadcast on VHF |
| VOR    | VHF Omni-directional Radio Range         |
| WAFC   | World Area Forecast Centre               |
| WAFS   | World Area Forecast System               |
| WGS-84 | World Geodetic System 84                 |

**ANNEX 1 - PART-ATCO**  
**SUBPART D - ATCO TRAINING**  
**Section 2 - Initial training requirements for Air Traffic Controllers**

**AMC1 to Appendix 8**  
**Approach Control Surveillance Rating (APS)**

- A. General principles that apply to this AMC are contained in ~~the~~~~its~~ ~~enclosed~~ Supplement ~~1 to AMC1~~.
- B. ATCO Rating training Approach Control Surveillance Rating (APS) should contain the following ~~subject objectives~~ and training objectives that are associated with the subjects, ~~subject objectives~~, topics and subtopics contained in **Appendix 8 - Approach Control Surveillance Rating (APS)**
- C. Subjects, ~~subject objectives~~, topics and subtopics from ~~the~~ Appendix 8 are repeated in this AMC for the convenience of the reader and do not form a part of it.

## NPA -> CRD TRACK CHANGES FILE

This document has been provided to help reviewers make a comparison between the corresponding AMCs to appendices of the NPA 2012-18 (15 Nov 2012) and the CRD (30 Sep 2013) of Licensing and medical certification of air traffic controllers Implementing Rule - Part (B.V) ATCO Initial training requirements.

To decode the changes the following conventions have been used:

**Deleted** information is shown with the ~~strikethrough-effect~~

**Relocated** information is shown with the ~~strikethrough-effect~~

**New** information is shown in ~~blue text~~.

When an existing objective has been relocated (and consequently renumbered) the new number is shown in black to the left of the objective and the original number in red below the new one.

3.2.1 - current objective number (if not modified it is the same as in NPA 2012-18 (B.V)

3.3.3 - old objective number that may have an additional subject indication if moved from one subject to another or B(asic) and R(ating) if moved from one syllabus to another

1.5.3 - new objective number for relocated objectives at its original location that may have an additional indication of a new subject or B(asic) and R(ating) if moved from one syllabus to another



## TABLE OF CONTENTS

|  |    |
|--|----|
| SUBJECT 1: INTRODUCTION TO THE COURSE-----   | 3  |
| SUBJECT 2: AVIATION LAW-----   | 5  |
| SUBJECT 3: AIR TRAFFIC MANAGEMENT-----   | 7  |
| SUBJECT 4: METEOROLOGY-----  | 19 |
| SUBJECT 5: NAVIGATION-----   | 20 |
| SUBJECT 6: AIRCRAFT-----   | 22 |
| SUBJECT 7: HUMAN FACTORS-----  | 25 |
| SUBJECT 8: EQUIPMENT AND SYSTEMS-----  | 30 |
| SUBJECT 9: PROFESSIONAL ENVIRONMENT-----   | 33 |
| SUBJECT 10: <del>UNUSUAL/DEGRADED</del> ABNORMAL AND EMERGENCY<br>SITUATIONS ----- | 35 |
| SUBJECT 11: AERODROMES -----   | 38 |
| Supplements -----  | 41 |

## Subject 1 : INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

### TOPIC INTR 1 COURSE MANAGEMENT

| Subtopic          | INTR 1.1  | Course introduction                       |  |     |
|-------------------|---|---|--|-----|
| APS<br>INTR 1.1.1 | Explain the aims and main objectives of the course.                 | 2   |  | ALL |
| Subtopic          | INTR 1.2  | Course administration                     |  |     |
| APS<br>INTR 1.2.1 | State course administration.  | 1   |  | ALL |
| Subtopic          | INTR 1.3  | Study material and training documentation |  |     |
| APS<br>INTR 1.3.1 | Use appropriate documentation and their sources for course studies. | 3   | Optional content: Training documentation, library, CBT library, Web, Learning Management Server        | ALL |
| APS<br>INTR 1.3.2 | Integrate appropriate information into course studies.              | 4   | Training documentation<br>Optional content: Training documentation, supplementary information, library | ALL |

### TOPIC INTR 2 INTRODUCTION TO THE ATC TRAINING COURSE

| Subtopic          | INTR 2.1  | Course content and organisation |  |     |
|-------------------|---|---------------------------------|--|-----|
| APS<br>INTR 2.1.1 | State the different training methods applied in the course. | 1                               | Theoretical training, practical training, self-study, types of training events                                   | ALL |
| APS<br>INTR 2.1.2 | State the subjects of the course and their purpose.         | 1                               |  | ALL |
| APS<br>INTR 2.1.3 | Describe the organisation of theoretical training.          | 2                               | Optional content: course programme   | ALL |
| APS<br>INTR 2.1.4 | Describe the organisation of practical training.            | 2                               | Optional content: PTP, Simulation, Briefing, Debriefing, course programme  | ALL |
| Subtopic          | INTR 2.2  | Training ethos                  |  |     |
| APS<br>INTR 2.2.1 | Recognise the feedback mechanisms available.                | 1                               | Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback | ALL |
| Subtopic          | INTR 2.3  | Assessment process              |  |     |

---

|            |                                  |
|------------|----------------------------------|
| APS        | Describe the assessment process. |
| INTR 2.3.1 |                                  |

---

2

ALL

## Subject 2 : AVIATION LAW

The subject objective is:

Learners shall ~~not~~ know, understand and apply the Rules of the Air and the Regulations regarding reporting, airspace and ~~not~~ appreciate the Licensing and Competence principles.

### TOPIC LAW 1 ATCO LICENSING / CERTIFICATE OF COMPETENCE

| Subtopic                      | LAW 1.1  | Privileges and conditions |  |     |
|-------------------------------|--|---------------------------|--|-----|
| APS<br>LAW 1.1.1              | Appreciate the conditions which <del>must</del> shall be met <del>to for the</del> issue <del>an of</del> Approach Control Surveillance rating <del>with Radar endorsement</del> . | 3                         | Commission Regulation (EU) <del>on ATCO Licensing No xxx/yyyy 805/2011</del> | APS |
|                               |  |                           | Optional content: National documents   |     |
| APS<br>LAW 1.1.2<br>6.1.1 HUM | Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.  | 2                         |  | ALL |
| APS<br>LAW 1.1.3<br>1.1.2     | Explain the conditions for suspension/revocation of ATCO licence.  | 2                         | Commission Regulation (EU) <del>on ATCO Licensing No xxx/yyyy 805/2011</del> | ALL |

### TOPIC LAW 2 RULES AND REGULATIONS

| Subtopic         | LAW 2.1  | Reports  |  |     |
|------------------|--|----------|--|-----|
| APS<br>LAW 2.1.1 | List the standard forms for reports.   | 1        | Air traffic incident report<br><br><i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>  | ALL |
| APS<br>LAW 2.1.2 | Describe the functions of, and processes for, reporting.   | 2        | Reporting culture, Air traffic incident report<br><br><i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>                                | ALL |
| APS<br>LAW 2.1.3 | Use forms for reporting.   | 3        | Air traffic incident reporting form(s)<br><br><i>Optional content: ICAO Doc 4444 Appendix 4, routine air reports, breach of regulations, watch/log book, records</i>                       | ALL |
| Subtopic         | LAW 2.2  | Airspace |  |     |
| APS<br>LAW 2.2.1 | Appreciate classes and structure of airspace and their relevance to Approach Control Surveillance rating operations. | 3        |  | APS |
| APS<br>LAW 2.2.2 | Provide planning, coordination and control actions appropriate to the airspace classification and structure.         | 4        | <i>Optional content: ICAO Annex 2, ICAO Annex 11, International requirements, Civil requirements, Military requirements, Areas of responsibility, Sectorisation, National requirements</i> | ALL |

|  |  |   |  |     |
|--|--|---|--|-----|
| APS<br>LAW 2.2.3   | Appreciate responsibility for terrain clearance.   | 3 |  | ALL |
| <b>TOPIC    LAW 3   ATC SAFETY MANAGEMENT</b>            |  |   |  |     |
| <b>Subtopic    LAW 3.1   Experience-Feedback process</b> |  |   |  |     |
| APS<br>LAW 3.1.1<br>10.1.1 HUM                           | State the importance of <del>the</del> controllers contribution to the <del>experience</del> feedback process. | 1 | <i>Optional content: voluntary reporting</i>   | ALL |
| APS<br>LAW 3.1.2<br>10.1.2 HUM                           | Describe how reported occurrences are analysed.  | 2 | <i>Optional content: ESARR 2, local procedures</i>   | ALL |
| APS<br>LAW 3.1.3<br>10.1.3 HUM                           | Name the means used to disseminate recommendations.  | 1 | <i>Optional content: Safety letters, safety boards web pages</i>                                 | ALL |
| APS<br>LAW 3.1.4<br>10.1.4 HUM                           | <del>Appreciate</del> <del>Explain</del> the 'Just Culture' concept.   | 3 | <b>Benefits, prerequisites, constraints</b><br><i>Optional content: EAM 2 GUI 6, GAIN Report</i> | ALL |
| <b>Subtopic    LAW 3.2   Safety Investigation-Branch</b> |  |   |  |     |
| APS<br>LAW 3.2.1<br>10.2.1 HUM                           | Describe role and mission of Safety Investigation <del>Branch</del> in the improvement of safety.              | 2 |  | ALL |
| APS<br>LAW 3.2.2<br>10.2.2 HUM                           | Define working methods of Safety Investigation <del>Branch</del> .   | 1 |  | ALL |

### Subject 3 : AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

| TOPIC     | ATM 1   | PROVISION OF SERVICES                               | <del>AIR TRAFFIC SERVICES AND AIRSPACE MANAGEMENT</del>  |
|-----------|---|---|--|
| Subtopic  | ATM 1.1   | Air traffic control (ATC) service                   |  |
| APS       | Appreciate own area of responsibility.  | 3   | APP<br>ACP<br>APS<br>ACS   |
| ATM 1.1.1 |   |   |  |
| 1.1.2     |   |   |  |
| APS       | Provide <del>the appropriate</del> ATC approach   | 4   | ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals   |
| ATM 1.1.2 | control service.  |   | APP<br>APS   |
| 1.1.1     |   |   |  |
| Subtopic  | ATM 1.2   | Flight information service (FIS)                    |  |
| APS       | Provide FIS.  | 4   | ICAO Doc 4444  |
| ATM 1.2.1 |   |   | Optional content: national documents   |
| 1.2.2     |   |   |  |
| APS       | Use ATS surveillance system for the provision of FIS.   | 3   | ICAO Doc 4444, Information to identified aircraft concerning: traffic, navigation                                |
| ATM 1.2.2 |   |   | Optional content: weather  |
| 1.2.3     |   |   | APS<br>ACS   |
| APS       | Issue <del>Relay</del> appropriate information concerning the location of <del>other</del> conflicting traffic. | 3   | ICAO Doc 4444, Traffic information, Essential traffic information  |
| ATM 1.2.3 |   |   | APS<br>ACS<br>APP<br>ACP   |
| 1.2.1     |   |   |  |
| APS       | Appreciate the use of ATIS for the provision of flight information service by approach controller.              | 3   | APS<br>APP   |
| ATM 1.2.4 |   |   |  |
| Subtopic  | ATM 1.3   | Alerting service (ALRS)                             |  |
| APS       | Provide ALRS.   | 4   | ICAO Doc 4444  |
| ATM 1.3.1 |   |   | Optional content: national documents   |
| APS       | Respond to distress and urgency messages and signals.   | 3   | ICAO Annex 10, ICAO Doc 4444,  |
| ATM 1.3.2 |   |   | Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations |
| APS       | Use ATS surveillance system for the provision of ALRS.  | 3   | APS<br>ACS   |
| ATM 1.3.3 |   |   |  |
| Subtopic  | ATM 1.4   | ATS System capacity and air traffic flow management |  |

|   |   |   |  |                          |
|---|---|---|--|--------------------------|
| APS<br>ATM 1.4.1                                  | Appreciate principles of <del>ATFM</del> ATS system capacity and air traffic flow management. | 3 | Optional content: EUROCONTROL ATFCM Users Manual <del>Working principles of ATFM</del> , FABs, FUA, free flight, etc.  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 1.4.2                                  | Apply flow management procedures in the provision of ATC.                                     | 3 | Optional content: EUROCONTROL ATFCM Users Manual   | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 1.4.3                                  | Organise traffic flows and patterns to take account of airspace boundaries.                   | 4 | Optional content: Civil and Military, Controlled, Uncontrolled, Advisory, Restricted, Danger, Prohibited, Special rules, Sector boundaries, National boundaries, FIR boundaries, Delegated airspace, Transfer of control, Transfer of communications, En-route, Off-route  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 1.4.4                                  | Organise traffic flows and patterns to take account of areas of responsibility.               | 4 | Optional content: EUROCONTROL ATFCM Users Manual   | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 1.4.5                                  | Inform supervisor of situation.   | 3 | Optional content: Abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, , unusual meteorological conditions, relevant information like: reported ground-based incidents, forest fire, smoke, oil pollution | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 1.4.6                                  | Organise traffic flows and patterns to take account of ATS surveillance system capability.    | 4 | Optional content: <del>radar</del> surveillance coverage   | APS<br>ACS               |
| <b>Subtopic ATM 1.5 Airspace management (ASM)</b> |   |   |  |                          |
| APS<br>ATM 1.5.1                                  | Appreciate the principles and means of ASM.   | 3 | Optional content: FABs, FUA, ICAO Doc 4444, EUROCONTROL ASM HBK - Airspace Management Handbook for the application of FUA, TSAs, CDRs, CBAs  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 1.5.2                                  | Organise traffic to take account of ASM.  | 4 | real-time activation, deactivation or reallocation of airspace<br><br>Optional content: CDR, TSA, TRA, CBA   | APS<br>ACS               |

## TOPIC ATM 2 COMMUNICATION

|   |   |   |  |     |
|---|---|---|--|-----|
| <b>Subtopic ATM 2.1 Effective communication</b> |   |   |  |     |
| APS<br>ATM 2.1.1                                | Use approved phraseology.   | 3 | ICAO Doc 4444<br><br>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2 | ALL |
| APS<br>ATM 2.1.2                                | Ensure effective <del>Perform</del> communication.<br><del>effectively.</del> | 4 | Communication techniques, Readback/verification of readback  | ALL |

|           |  |   |     |
|-----------|--|---|-----|
| APS       | <del>Analyse examples of pilot and controller communication for effectiveness.</del> | 4 | ALL |
| ATM 2.1.3 |  |   |     |
| 6.1.2 HUM |  |   |     |

## TOPIC ATM 3 ATC CLEARANCES AND ATC INSTRUCTIONS

| Subtopic  | ATM 3.1  | ATC clearances   |                                      |     |
|-----------|--|------------------|--------------------------------------|-----|
| APS       | Issue appropriate ATC clearances.                          | 3                | ICAO Doc 4444                        | ALL |
| ATM 3.1.1 |  |                  | Optional content: national documents |     |
| APS       | Integrate appropriate ATC clearances in control service.   | 4                |                                      | ALL |
| ATM 3.1.2 |  |                  |                                      |     |
| APS       | Ensure the agreed course of action is carried out.         | 4                |                                      | ALL |
| ATM 3.1.3 |  |                  |                                      |     |
| Subtopic  | ATM 3.2  | ATC instructions |                                      |     |
| APS       | Issue appropriate ATC instructions.                        | 3                | ICAO Doc 4444                        | ALL |
| ATM 3.2.1 |  |                  | Optional content: national documents |     |
| APS       | Integrate appropriate ATC instructions in control service. | 4                |                                      | ALL |
| ATM 3.2.2 |  |                  |                                      |     |
| APS       | Ensure the agreed course of action is carried out.         | 4                |                                      | ALL |
| ATM 3.2.3 |  |                  |                                      |     |

## TOPIC ATM 4 COORDINATION

| Subtopic  | ATM 4.1                                   | Necessity for coordination         |   |     |
|-----------|---|------------------------------------|---|-----|
| APS       | Identify the need for coordination.       | 3                                  |   | ALL |
| ATM 4.1.1 |   |                                    |   |     |
| Subtopic  | ATM 4.2                                   | Tools and methods for coordination |   |     |
| APS       | Use the available tools for coordination. | 3                                  | Optional content: Electronic transfer of flight data, Telephone, Interphone, Intercom, Direct speech, Radiotelephone (RTF), Local agreements, automated system coordination | ALL |
| ATM 4.2.1 |   |                                    |   |     |
| Subtopic  | ATM 4.3                                   | Coordination procedures            |   |     |
| APS       | Initiate appropriate coordination.        | 3                                  | Delegation/transfer of responsibility for air-ground communications and separation, transfer of control, etc. ICAO Doc 4444   | ALL |
| ATM 4.3.1 |   |                                    | Optional content: release point   |     |



|                  |  |   |   |     |
|------------------|--|---|---|-----|
| APS<br>ATM 4.3.2 | Analyse effect of coordination requested by an adjacent position/unit. | 4 | <i>Optional content: Delegation/transfer of responsibility for air-ground communications and separation, release point, transfer of control, etc.</i>       | ALL |
| APS<br>ATM 4.3.3 | Select, after negotiation, an appropriate course of action.            | 5 | <del>When additional traffic cannot be accepted by adjacent position/unit ;<br/>When additional traffic cannot be accepted by own position/unit, etc.</del> | ALL |
| APS<br>ATM 4.3.4 | Ensure the agreed course of action is carried out.                     | 4 |   | ALL |
| APS<br>ATM 4.3.5 | Coordinate in the provision of FIS.                                    | 4 | ICAO Doc 4444   | ALL |
| APS<br>ATM 4.3.6 | Coordinate in the provision of ALRS.                                   | 4 | ICAO Doc 4444   | ALL |

## TOPIC ATM 5 ALTIMETRY AND LEVEL ALLOCATION

| Subtopic         | ATM 5.1  | Altimetry         |  |            |
|------------------|--|-------------------|--|------------|
| APS<br>ATM 5.1.1 | Allocate levels <del>(height, altitude, flight level)</del> according to altimetry data.                                   | 4                 | ICAO Doc 8168, ICAO Doc 4444   | ALL        |
| APS<br>ATM 5.1.2 | Ensure separation according to altimetry data.   | 4                 | <i>Optional content: Transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries</i>                 | ALL        |
| Subtopic         | ATM 5.2  | Terrain clearance |  |            |
| APS<br>ATM 5.2.1 | Provide planning, coordination and control actions appropriate to the rules for minimum safe levels and terrain clearance. | 4                 | <i>Optional content: Minimum vectoring altitude, Terrain clearance dimensions, Minimum safe altitudes, Transition level, Minimum flight level, Minimum sector altitude</i> | APS<br>ACS |

## TOPIC ATM 6 SEPARATIONS

| Subtopic         | ATM 6.1  | Vertical separation |  |                          |
|------------------|--|---------------------|--|--------------------------|
| APS<br>ATM 6.1.1 | Provide standard vertical separation.                        | 4                   | ICAO Doc 4444, ICAO Doc 7030, Level allocation, During climb/descent, Rate of climb/descent, <b>holding pattern</b>    | APP<br>APS               |
| APS<br>ATM 6.1.2 | Provide increased vertical separation.                       | 4                   | ICAO Doc 4444, ICAO Doc 7030<br><i>Optional content: Level allocation, During climb/descent, Rate of climb/descent</i> | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 6.1.3 | Appreciate the application of vertical emergency separation. | 3                   | ICAO Doc 4444, ICAO Doc 7030   | APP<br>ACP<br>APS<br>ACS |

|  |  |   |  |            |
|--|--|---|--|------------|
| APS<br>ATM 6.1.4   | Provide vertical separation in a surveillance environment.   | 4 | Pressure altitude-derived information, pilot level reports<br><br><i>Optional content: Into/out of ATS surveillance system coverage</i>  | APS<br>ACS |
| <b>Subtopic ATM 6.2 Longitudinal Horizontal separation in a surveillance environment</b> |  |   |  |            |
| APS<br>ATM 6.2.1   | Provide longitudinal separation in a surveillance environment.   | 4 | Successive departures, successive arrivals, overflights, speed control, silent transfer, ICAO Doc 4444<br><br><i>Optional content: Within ATS surveillance system coverage</i> | APS        |
| <b>Subtopic ATM 6.3 Delegation of separation</b>   |  |   |  |            |
| APS<br>ATM 6.3.1   | Delegate separation to pilots in the case of aircraft executing successive visual approaches.                                    | 4 |  | APP<br>APS |
| APS<br>ATM 6.3.2   | Appreciate the conditions which must be met when delegating separation to pilots to fly maintaining own separation while in VMC. | 3 | ICAO Doc 4444  | APP<br>APS |
| <b>Subtopic ATM 6.4 Wake turbulence distance-based separation</b>                        |  |   |  |            |
| APS<br>ATM 6.4.1   | Provide distance-based wake turbulence separation.   | 4 | ICAO Doc 4444<br><br><i>Optional content: national documents</i>   | APS<br>ACS |
| <b>Subtopic ATM 6.5 Separation based on ATS surveillance systems</b>                     |  |   |  |            |
| APS<br>ATM 6.5.1   | Describe how separation based on ATS surveillance systems is applied.  | 2 | ICAO Doc 4444  | APS<br>ACS |
| APS<br>ATM 6.5.2   | Provide horizontal separation.   | 4 | ICAO Doc 4444, ICAO Doc 7030<br>Local operation manuals, holding   | APS<br>ACS |
| APS<br>ATM 6.5.3   | Provide horizontal separation by using practising vectoring techniques in a variety of situations.                               | 4 | <i>Optional content: transit, meteorological phenomena, vectoring for approach, departure vs transit vs arrival</i>  | APS<br>ACS |
| APS<br>ATM 6.5.4   | Ensure horizontal or vertical separation from airspace boundaries.   | 4 | adjacent sectors, PRD, TSAs  | APS<br>ACS |
| <b>TOPIC ATM 7 AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS</b>     |  |   |  |            |
| <b>Subtopic ATM 7.1 Airborne collision avoidance systems</b>                             |  |   |  |            |
| APS<br>ATM 7.1.1<br>7.1.6 B  | Differentiate between ACAS advisory thresholds and ATC separation standards applicable in the approach control environment.      | 2 | ICAO Doc 9863<br><br><i>Optional content: EUROCONTROL TCAS Web page</i>  | APP<br>APS |

|  |   |   |   |                          |
|--|---|---|---|--------------------------|
| APS<br>ATM 7.1.2<br>7.1.4 B                      | Describe the controller responsibility during and following an ACAS RA reported by pilot. | 2 | ICAO Doc 4444   | ALL                      |
| APS<br>ATM 7.1.3<br>7.1.1                        | Respond to pilot notification of actions based on airborne systems warnings.              | 3 | ACAS, TAWS<br><i>Optional content: GPWS<br/>EUROCONTROL TCAS Web page</i> | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 7.2 Ground-based safety nets</b> |   |   |   |                          |
| APS<br>ATM 7.2.1                                 | Describe the controller responsibility during and following safety net warnings.          | 2 | ICAO Doc 4444<br><i>Optional content: STCA, MSAW, APW, APM</i>            | APS<br>ACS               |
| APS<br>ATM 7.2.2<br>7.2.1                        | Respond to ground-based safety nets warnings.   | 3 | <i>Optional content: STCA, MSAW, APW, APM</i>                             | APS<br>ACS               |

## TOPIC ATM 8 DATA DISPLAY

|   |  |   |   |     |
|---|--|---|---|-----|
| <b>Subtopic ATM 8.1 Data management</b> |  |   |   |     |
| APS<br>ATM 8.1.1                        | Update the data display to accurately reflect the traffic situation. | 3 | <i>Optional content: Information displayed, strip marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs</i> | ALL |
| APS<br>ATM 8.1.2                        | Analyse pertinent data on data displays.                             | 4 |   | ALL |
| APS<br>ATM 8.1.3                        | Organise pertinent data on data displays.                            | 4 |   | ALL |
| APS<br>ATM 8.1.4                        | <del>Process pertinent data on data displays.</del>                  | 3 |   | ALL |
| APS<br>ATM 8.1.4<br>8.1.5               | Obtain flight plan information.                                      | 3 | CPL, FPL, Supplementary information<br><i>Optional content: RPL, AFIL, etc.</i>   | ALL |
| APS<br>ATM 8.1.5<br>8.1.6               | Use flight plan information.   | 3 |   | ALL |

## TOPIC ATM 9 OPERATIONAL ENVIRONMENT (SIMULATED)

|  |  |   |   |     |
|--|--|---|---|-----|
| <b>Subtopic ATM 9.1 Integrity of the operational environment</b> |  |   |   |     |
| APS<br>ATM 9.1.1   | Obtain information concerning the operational environment. | 3 | <i>Optional content: Briefing, notices, local orders, verification of information</i> | ALL |

|  |  |   |  |                          |
|--|--|---|--|--------------------------|
| APS<br>ATM 9.1.2   | Ensure the integrity of the operational environment.                       | 4 | <i>Optional content: Integrity of displays, Verification of the information provided by displays, etc.</i> | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 9.2 Verification of the currency of operational procedures</b> |  |   |  |                          |
| APS<br>ATM 9.2.1   | Check all relevant documentation before managing traffic.                  | 3 | <i>Optional content: Briefing, LOAs, NOTAM, AICs</i>   | ALL                      |
| APS<br>ATM 9.2.2   | Manage traffic in accordance with procedural changes.                      | 4 |  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 9.3 Handover-takeover</b>                                      |  |   |  |                          |
| APS<br>ATM 9.3.1   | Transfer information to the relieving controller.                          | 3 |  | ALL                      |
| APS<br>ATM 9.3.2   | Obtain information from the controller handing over.                       | 3 |  | ALL                      |
| <b>TOPIC ATM 10 PROVISION OF CONTROL SERVICE</b>                               |  |   |  |                          |
| <b>Subtopic ATM 10.1 Responsibility and processing of information</b>          |  |   |  |                          |
| APS<br>ATM 10.1.1  | Describe the division of responsibility between air traffic control units. | 2 | ICAO Doc 4444  | ALL                      |
| APS<br>ATM 10.1.2  | Describe the responsibility in regard to military traffic.                 | 2 | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9554</i>  | ALL                      |
| APS<br>ATM 10.1.3<br>10.1.9  | Describe the responsibility in regard to unmanned free balloons.           | 2 | ICAO Doc 4444  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.1.4<br>10.1.3  | Obtain operational information.  | 3 | ICAO Doc 4444,<br>Local operation manuals  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.1.5<br>10.1.4  | Interpret operational information.   | 5 |  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.1.6<br>10.1.5  | Organise forwarding of operational information.                            | 4 | <i>Optional content: including the use of backup procedures</i>  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.1.7<br>10.1.6  | Integrate operational information into control decisions.                  | 4 |  | APP<br>ACP<br>APS<br>ACS |

|   |  |   |   |                          |
|---|--|---|---|--------------------------|
| APS<br>ATM 10.1.7<br>10.3.6                         | Ensure an adequate priority of actions.  | 4 | Formal and situational requirements, workload   | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.1.8<br>3.6.1 ACFT                     | Appreciate the influence of operational requirements.  | 3 | Optional content: Military flying, Calibration flights, Aerial photography                                      | ALL                      |
| APS<br>ATM 10.1.8<br>10.4.2                         | Balance the workload with the traffic demand.  | 5 | Optional content: in own sector, in adjacent sectors  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 10.2 ATS surveillance service</b>   |  |   |   |                          |
| APS<br>ATM 10.2.1                                   | Explain the responsibility for the provision of an ATS surveillance service appropriate to APS rating.                                     | 2 | ICAO Doc 4444, ICAO Annex 11, Local operation manuals   | APS                      |
| APS<br>ATM 10.2.2                                   | Explain the functions that may be performed with the use of ATS surveillance systems derived information presented on a situation display. | 2 | ICAO Doc 4444   | APS<br>ACS               |
| APS<br>ATM 10.2.3                                   | Provide planning, coordination and control actions appropriate to the VFR, SVFR and IFR in VMC and IMC.                                    | 4 | ICAO Annex 2, ICAO Annex 11, ICAO Doc 4444  | APS                      |
| APS<br>ATM 10.2.4                                   | Apply the procedures for termination of ATS surveillance service.  | 3 | ICAO Doc 4444<br>Optional content: transfer of control, termination or interruption of ATS surveillance service | APS<br>ACS               |
| <b>Subtopic ATM 10.3 Traffic management process</b> |  |   |   |                          |
| APS<br>ATM 10.3.1                                   | Ensure that situational awareness is maintained.   | 4 | Information gathering, scanning, traffic projection   | APS<br>ACS               |
| APS<br>ATM 10.3.2                                   | Detect conflicts in time for appropriate resolution.   | 4 |   | ALL                      |
| APS<br>ATM 10.3.3                                   | Identify potential solutions to achieve a safe and effective traffic flow.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.3.4                                   | Evaluate possible outcomes of different planning and control actions.  | 5 |   | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.3.5                                   | Select an appropriate plan in time to achieve safe and effective traffic flow.   | 5 |   | APP<br>ACP<br>APS<br>ACS |

|   |   |   |   |                          |
|---|---|---|---|--------------------------|
| APS<br>ATM 10.3.6<br>10.1.7   | Ensure an adequate priority of actions.                                 | 4 | Formal and situational requirements, workload   | ALL                      |
| APS<br>ATM 10.3.7   | Execute selected plan in a timely manner.                               | 3 |   | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.3.8   | Ensure a safe and efficient outcome is achieved.                        | 4 | Traffic monitoring, adaptability and follow up  | ALL                      |
| <b>Subtopic ATM 10.4 Handling traffic Vectoring</b>                   |   |   |   |                          |
| APS<br>ATM 10.4.1   | Manage arrivals, departures and overflights.                            | 4 |   | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.4.2<br>10.1.8   | Balance the workload with the traffic demand against personal capacity. | 5 | Optional content: in own sector, in adjacent sectors re-routing, re-planning, prioritising solutions, denying requests, delegating responsibility for separation                                  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ATM 10.4.3<br>10.3.1   | Define flight path monitoring and vectoring.                            | 1 | ICAO Doc 4444   | APS<br>ACS               |
| APS<br>ATM 10.4.4<br>10.3.2   | Explain the requirements for vectoring and termination of vectoring.    | 2 | ICAO Doc 4444   | APS<br>ACS               |
| APS<br>ATM 10.4.5<br>10.3.3   | Provide vectoring.  | 4 | ICAO Doc 4444<br><br>Optional content: separation, expediting arrivals, departures and/or climb to cruising levels, aircraft leaving the hold, navigation assistance, uncontrolled airspace, etc. | APS<br>ACS               |
| APS<br>ATM 10.4.6<br>10.3.4   | Apply the procedures for termination of vectoring.                      | 3 | ICAO Doc 4444   | APS<br>ACS               |
| APS<br>ATM 10.4.7   | Manage traffic on different types of approaches.                        | 4 | precision, non-precision, visual  | APP<br>APS               |
| APS<br>ATM 10.4.8   | Initiate missed approach.   | 3 | ICAO Doc 4444   | APP<br>APS               |
| APS<br>ATM 10.4.9   | Integrate aircraft on missed approach into the traffic situation.       | 4 |   | APP<br>APS               |
| <b>Subtopic ATM 10.5 Control service with advanced system support</b> |   |   |   |                          |

|  |                      |   |   |  |                          |
|--|----------------------|---|---|--|--------------------------|
| APS  | 10.4.1               | Appreciate <del>Explain</del> the impact of advanced systems on the provision of approach control service.  | 3 | Optional content: sequencing systems, arrival management, departure management, automated holding lists, vertical traffic displays, conflict detection and decision making tools, automated information and coordination tools | APS                      |
| <b>TOPIC ATM 11 HOLDING</b>                                    |                      |   |   |  |                          |
| <b>Subtopic ATM 11.1 General holding procedures</b>            |                      |   |   |  |                          |
| APS  | ATM 11.1.1           | Apply holding procedures.   | 3 | ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times  | APP<br>ACP<br>APS<br>ACS |
| APS  | ATM 11.1.2           | Appreciate the factors affecting holding patterns. <del>effect of: wind, aircraft speed, rate of turn, height, aircraft type, aircraft performance:</del> | 3 | effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 11.2 Vertical separation in holding</b>        |                      |   |   |  |                          |
| APS  | ATM 11.2.1<br>6.1.1  | <del>Provide vertical separation between aircraft in a holding pattern:</del>   | 4 |  | APP<br>ACP<br>APS<br>ACS |
| APS  | ATM 11.2.2<br>6.1.1  | <del>Provide vertical separation between aircraft in a holding pattern and other aircraft:</del>  | 4 |  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 11.2 Approaching aircraft</b>                  |                      |   |   |  |                          |
| APS  | ATM 11.2.1<br>11.3.1 | Calculate Expected Approach Times (EATs) and Expected Onward Clearance times.   | 3 |  | APP<br>APS               |
| APS  | ATM 11.2.2<br>11.3.2 | Organise the traffic landing sequence in a holding pattern.   | 4 | Optional content: company preference, aircraft performance, aircraft approach capability, ILS categories, flow control management  | APP<br>APS               |
| <b>Subtopic ATM 11.3 Holding in a surveillance environment</b> |                      |   |   |  |                          |
| APS  | ATM 11.4.1<br>10.4.3 | <del>Provide vectors to aircraft leaving a holding pattern:</del>   | 4 |  | APS<br>ACS               |
| APS  | ATM 11.3.1<br>11.4.2 | Organise traffic to separate other aircraft from holding aircraft.  | 4 |  | APS<br>ACS               |

|  |   |   |  |            |
|--|---|---|--|------------|
| APS<br>ATM <del>11.4.3</del><br>12.3.1                   | Ensure identity of aircraft leaving a holding pattern.                        | 4 |  | APS<br>ACS |
| APS<br>ATM 11.3.2<br>11.4.4                              | Integrate system support, when available.                                     | 4 | Optional content: arrival management system, automated holding lists, vertical traffic displays  | APS<br>ACS |
| <b>TOPIC ATM 12 IDENTIFICATION</b>                       |   |   |  |            |
| <b>Subtopic ATM 12.1 Establishment of identification</b> |   |   |  |            |
| APS<br>ATM 12.1.1<br>12.1.3                              | Appreciate the precautions when establishing identification.                  | 3 |  | APS<br>ACS |
| APS<br>ATM <del>12.1.1</del><br>9.4.1 ATMB               | <del>Explain the methods and procedures of establishing identification.</del> | 2 | <del>ICAO Doc 4444</del><br><del>Optional content: PSR</del>   | APS<br>ACS |
| APS<br>ATM 12.1.2  | Identify aircraft.  | 3 | Optional content: PSR, SSR or ADS identification method  | APS<br>ACS |
| APS<br>ATM <del>12.1.2</del><br>12.1.2<br>9.4.2 ATMB     | <del>Apply the procedures of establishing identification.</del>               | 3 | Any of the ATS Surveillance systems identification methods   | APS<br>ACS |
| APS<br>ATM 12.1.3<br>12.1.4                              | Apply procedures in the case of misidentification.                            | 3 |  | APS<br>ACS |
| <b>Subtopic ATM 12.2 Maintenance of identification</b>   |   |   |  |            |
| APS<br>ATM 12.2.1  | Appreciate the necessity to maintain identification.                          | 3 |  | APS<br>ACS |
| <b>Subtopic ATM 12.3 Loss of identity</b>                |   |   |  |            |
| APS<br>ATM 12.3.1  | Appreciate when an aircraft identification is lost or in doubt.               | 3 | Optional content: Out of ATS surveillance system coverage, failure of ATS surveillance system, weather clutter, other clutter, garbling, holding, etc. | APS<br>ACS |
| APS<br>ATM 12.3.2  | Apply methods to re-establish identification.                                 | 3 |  | APS<br>ACS |
| APS<br>ATM 12.3.3  | Respond to loss/doubt concerning identification.                              | 3 | Optional content: procedural separation  | APS<br>ACS |



| <b>Subtopic    ATM 12.4    Position information</b> |  |   |               |            |
|---|--|---|---------------|------------|
| APS<br>ATM 12.4.1                                   | Appreciate the circumstances when position information should be passed to the aircraft. | 3 |               | APS<br>ACS |
| APS<br>ATM 12.4.2                                   | State the format in which position information can be passed to aircraft.                | 1 | ICAO Doc 4444 | APS<br>ACS |
| <b>Subtopic    ATM 12.5    Transfer of identity</b> |  |   |               |            |
| APS<br>ATM 12.5.1                                   | Apply the methods of transfer of identification.   | 3 |               | APS<br>ACS |
| APS<br>ATM 12.5.2                                   | Appreciate the precautions when transferring identification.                             | 3 |               | APS<br>ACS |

## Subject 4 : METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

| TOPIC MET 1 METEOROLOGICAL PHENOMENA       |   |                                       |   |                          |  |
|--|---|---------------------------------------|---|--------------------------|--|
| Subtopic                                   | MET 1.1   | Meteorological phenomena              |   |                          |  |
| APS<br>MET 1.1.1                           | Appreciate the impact of adverse weather.   | 3                                     | Thunderstorms, Icing, Clear Air Turbulence (CAT), Turbulence, Microburst, Wind shear, Severe mountain waves, Line squalls, Volcanic ash | APP<br>APS               |  |
|  |   |                                       | Optional content: Volcanic ash  |                          |  |
| APS<br>MET 1.1.2                           | Integrate data about meteorological phenomena into provision of ATS.  | 4                                     | clearances, instructions and transmitted information  | ALL                      |  |
|  |   |                                       | Optional content: relevant meteorological phenomena<br>Separation, holding, diversions, re-routings, etc.                               |                          |  |
| APS<br>MET <del>1.1.3</del><br>1.1.2       | <del>Integrate data about meteorological phenomena into clearances, instructions and transmitted information.</del> | 4                                     | <del>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</del>  | APP<br>ACP<br>APS<br>ACS |  |
| APS<br>MET 1.1.3<br>1.1.4                  | Use techniques to avoid adverse weather when necessary/possible.  | 3                                     | Rerouting, level change, etc.   | APP<br>ACP<br>APS<br>ACS |  |
| TOPIC MET 2 SOURCES OF METEOROLOGICAL DATA |   |                                       |   |                          |  |
| Subtopic                                   | MET 2.1   | Sources of meteorological information |   |                          |  |
| APS<br>MET 2.1.1                           | Obtain meteorological information   | 3                                     | METAR, TAF, SIGMET, AIRMET  | APP<br>ACP<br>APS<br>ACS |  |
|  |   |                                       | Optional content: AIREP/AIREP Special   |                          |  |
| APS<br>MET 2.1.2                           | Relay meteorological information.   | 3                                     | ICAO Doc 4444 <del>To: aircraft, MET office</del>   | APP<br>ACP<br>APS<br>ACS |  |
|  |   |                                       | Optional content: flight information centre, adjacent ATS unit  |                          |  |

## Subject 5 : NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

| TOPIC NAV 1 MAPS AND AERONAUTICAL CHARTS |   |                                    |  |                          |  |
|--|---|------------------------------------|--|--------------------------|--|
| Subtopic                                 | NAV 1.1   | Maps and charts                    |  |                          |  |
| APS<br>NAV 1.1.1                         | Decode symbols and information displayed on aeronautical maps and charts.                                     | 3                                  | Instrument approach charts, SID charts, aerodrome charts, visual approach charts<br><br>Optional content: Military maps and charts   | ADI<br>APP<br>APS        |  |
| APS<br>NAV 1.1.2<br>1.1.1                | Use relevant maps and charts.   | 3                                  |  | APP<br>ACP<br>APS<br>ACS |  |
| TOPIC NAV 2 INSTRUMENTAL NAVIGATION      |   |                                    |  |                          |  |
| Subtopic                                 | NAV 2.1   | Navigational systems               |  |                          |  |
| APS<br>NAV 2.1.1                         | Manage traffic in case of change in the operational status of navigational systems.                           | 4                                  | Optional content: limitations, status of ground-based and satellite-based systems  | APP<br>ACP<br>APS<br>ACS |  |
| APS<br>NAV 2.1.2                         | Appreciate the effect of precision, limitations and change of the operational status of navigational systems. | 3                                  | Optional content: limitations, status, degraded procedures   | ALL                      |  |
| Subtopic                                 | NAV 2.2   | Stabilised approach                |  |                          |  |
| APS<br>NAV 2.2.1                         | Describe the concept of stabilised approach.  | 2                                  | ICAO Doc 8168, Regulation (EC) No 1899/2006<br><br>Optional content: SKYbrary  | ADV<br>ADI<br>APP<br>APS |  |
| APS<br>NAV 2.2.2                         | Appreciate the effect of late change of runway-in-use or type of approach for landing aircraft.               | 3                                  |  | APP<br>APS               |  |
| APS<br>NAV 2.2.3                         | Appreciate controller actions that may contribute to unstabilised approach.                                   | 3                                  | Inappropriate speed control, vectoring for short final, vectoring for approach with significant tailwind, glide path interception from above, lack or incorrect distance to touchdown information, delayed descent | APS                      |  |
| Subtopic                                 | NAV 2.3   | Instrument departures and arrivals |  |                          |  |
| APS<br>NAV 2.3.1                         | Characterise SIDs.  | 2                                  |  | ADI<br>APP<br>APS        |  |
| APS<br>NAV 2.3.2                         | Describe the types and phases of instrument approach procedures.  | 2                                  |  | APP<br>APS               |  |

|   |   |   |  |                                 |
|---|---|---|--|---------------------------------|
| APS<br>NAV 2.3.3                                | Describe the relevant minima applicable for a precision/non-precision and visual approach.  | 2 |  | ADI<br>APP<br>APS               |
| <b>Subtopic NAV 2.4 Navigational assistance</b> |   |   |  |                                 |
| APS<br>NAV 2.4.1<br>2.2.1                       | Evaluate the necessary information to be provided to pilots in need of navigational assistance.                                     | 5 | Optional content: Nearest most suitable aerodrome, Track, Heading, Distance, Aerodrome information, Any other navigational assistance relevant at the time | APP<br>ACP<br>APS<br>ACS        |
| APS<br>NAV 2.4.2<br>2.2.2                       | Assist aircraft in navigation when required.  | 3 | Aircraft observed to be deviating from its known intended route, on request  | APS<br>ACS                      |
| <b>Subtopic NAV 2.5 Satellite-based systems</b> |   |   |  |                                 |
| APS<br>NAV 2.5.1<br>2.3.1                       | State the different applications <del>operations associated with</del> of satellite-based systems relevant for approach operations. | 1 | Optional content: NPA, APV-baro VNAV, APV, LPV, Precision approach, ICAO Doc 8168 Vol.2  | APP<br>APS                      |
| <b>Subtopic NAV 2.6 PBN applications</b>        |   |   |  |                                 |
| APS<br>NAV 2.6.1                                | State the navigation applications used in approach and terminal environments.   | 1 | Approach-RNP APCH/ RNP AR APCH; Terminal-RNAV-1 ( $\approx$ P-RNAV)<br><br>Optional content: A-RNP, EC PBN Implementing Rule, ICAO Doc 9613                | APP<br>APS                      |
| APS<br>NAV 2.6.2                                | Explain the principles and designation of navigation specifications in use.   | 2 | Optional content: performance, functionality, sensors, aircrew and controller requirements   | APP<br>ACP<br>APS<br>ACS        |
| APS<br>NAV 2.6.3                                | State future PBN developments.  | 1 | A-RNP, APV<br><br>Optional content: RNP 3D, RNP 4D   | ADI<br>APP<br>ACP<br>APS<br>ACS |

## Subject 6 : AIRCRAFT

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

### TOPIC ACFT 1 AIRCRAFT INSTRUMENTS

| Subtopic                     | ACFT 1.1  | Aircraft instruments |   |                   |
|------------------------------|---|----------------------|---|-------------------|
| APS<br>ACFT 1.1.1            | Integrate <del>the information</del> <b>indication</b> from aircraft instruments provided by the pilot in the provision of ATS. | 4                    | <del>Optional content: TCAS, wind shear indicator, weather radar</del>    | ALL               |
| APS<br>ACFT 1.1.2            | Explain the operation of aircraft radio equipment.  | 2                    | Optional content: Radios (number of), emergency radios, <del>SELCAL</del> | ALL               |
| APS<br>ACFT 1.1.3            | Explain the operation of on-board surveillance equipment.   | 2                    | Transponders: equipment Mode A, Mode C, Mode S, ADS capability            | ADI<br>APS<br>ACS |
| APS<br>ACFT <del>1.1.4</del> | <del>Explain the use and benefits of CPDLC.</del>   | 2                    |   | ALL               |

### TOPIC ACFT 2 AIRCRAFT CATEGORIES

| Subtopic          | ACFT 2.1  | Wake turbulence categories              |               |                   |
|-------------------|---|---|---------------|-------------------|
| APS<br>ACFT 2.1.1 | Explain the wake turbulence effect and associated hazards to the succeeding aircraft.                     | 2                                       |               | ALL               |
| APS<br>ACFT 2.1.2 | Appreciate the techniques used to prevent hazards associated with wake turbulence on succeeding aircraft. | 3                                       |               | ALL               |
| Subtopic          | ACFT 2.2  | Application of ICAO approach categories |               |                   |
| APS<br>ACFT 2.2.1 | Describe the use of ICAO approach categories.   | 2                                       | ICAO Doc 8168 | ADI<br>APP<br>APS |
| APS<br>ACFT 2.2.2 | Appreciate the effect of ICAO approach categories on the traffic organisation.                            | 3                                       |               | ADI<br>APP<br>APS |

### TOPIC ACFT 3 FACTORS AFFECTING AIRCRAFT PERFORMANCE

| Subtopic          | ACFT 3.1  | Climb factors |  |                          |  |
|-------------------|---|---------------|--|--------------------------|--|
| APS<br>ACFT 3.1.1 | Integrate the influence of factors affecting aircraft during climb. | 4             | Optional content: speed, mass, air density, cabin pressurisation, wind and temperature | APP<br>ACP<br>APS<br>ACS |  |

|   |  |   |  |                          |
|---|--|---|--|--------------------------|
| APS<br>ACFT 3.1.2   | Appreciate the influence of factors affecting aircraft on take-off.  | 3 | <i>Optional content: runway conditions, runway slope, aerodrome elevation, wind, temperature, aircraft configuration, airframe contamination and aircraft mass</i> | APP<br>APS               |
| <b>Subtopic ACFT 3.2 Cruise factors</b>                       |  |   |  |                          |
| APS<br>ACFT 3.2.1   | Integrate the influence of factors affecting aircraft during cruise.   | 4 | Level, cruising speed, wind, mass, cabin pressurisation  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ACFT 3.3 Descent and initial approach factors</b> |  |   |  |                          |
| APS<br>ACFT 3.3.1   | Integrate the influence of factors affecting aircraft during descent.  | 4 | <i>Optional content: wind, speed, rate of descent, aircraft configuration, cabin pressurisation</i>  | APP<br>APS               |
| <b>Subtopic ACFT 3.4 Final approach and landing factors</b>   |  |   |  |                          |
| APS<br>ACFT 3.4.1   | Integrate the influence of factors affecting aircraft during final approach and landing.   | 4 | <i>Optional content: wind, aircraft configuration, mass, meteorological conditions, runway conditions, runway slope, aerodrome elevation</i>                       | APP<br>APS               |
| <b>Subtopic ACFT 3.5 Economic factors</b>                     |  |   |  |                          |
| APS<br>ACFT 3.5.1   | Integrate consideration of economic factors affecting aircraft.  | 4 | <i>Optional content: Routing, Level, Speed, Rate of climb and Rate of descent, Approach profile</i>  | APP<br>APS               |
| APS<br>ACFT 3.5.2   | Use continuous climb techniques where applicable.  | 3 |  | APP<br>ACP<br>APS<br>ACS |
| APS<br>ACFT 3.5.3   | Use direct routing where applicable.   | 3 |  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ACFT 3.6 <del>Miscellaneous Factors</del></b>     |  |   |  |                          |
| APS<br>ACFT 3.6.1<br>10.1.8 ATM                               | <del>Appreciate the influence of operational requirements:</del>   | 3 | <del><i>Optional content: Military flying, Calibration flights, Aerial photography, banner towing</i></del>  | APP<br>APS               |
| <b>Subtopic ACFT 3.6 Environmental factors</b>                |  |   |  |                          |
| APS<br>ACFT 3.6.1<br>3.7.1                                    | Appreciate the performance restrictions due to environmental constraints.<br><del>Estimate the influence of ecological factors affecting aircraft.</del> | 3 | <i>Optional content: Fuel dumping, Noise abatement procedures, Minimum flight levels, Bird hazard, Continuous Descent Operations Approach</i>                      | APP<br>APS               |

**TOPIC ACFT 4 AIRCRAFT DATA****Subtopic ACFT 4.1 Performance data**

|                                 |   |   |  |                          |
|---------------------------------|---|---|--|--------------------------|
| APS<br>ACFT 4.1.1               | Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/working environment into the provision of a control service. | 4 | Performance data under a representative variety of circumstances | APP<br>ACP<br>APS<br>ACS |
| APS<br>ACFT 4.1.2<br>1.1.2 ABES | <del>Identify potential or actual emergency situations.</del>   | 3 |  | APP<br>ACP<br>APS<br>ACS |

## Subject 7 : HUMAN FACTORS

The subject objective is:

Learners shall ~~not~~ recognise the necessity to constantly extend their knowledge ~~and~~ ~~not~~ analyse factors which affect personal and team performance.

| TOPIC HUM 1 PSYCHOLOGICAL FACTORS             |  |           |  |  |     |
|---|--|-----------|--|--|-----|
| Subtopic                                      | HUM 1.1  | Cognitive |  |  |     |
| APS<br>HUM 1.1.1                              | Describe the human information processing model.                                     | 2         | Attention, perception, memory, situational awareness, decision making, response  |  | ALL |
| APS<br>HUM 1.1.2                              | Describe the factors which influence human information processing.                   | 2         | Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations  |  | ALL |
| APS<br>HUM 1.1.3                              | Monitor the effect of human information processing factors on decision making.       | 3         | <i>Optional content: workload, stress, interpersonal relations, distraction, confidence</i>  |  | ALL |
| TOPIC HUM 2 MEDICAL AND PHYSIOLOGICAL FACTORS |  |           |  |  |     |
| Subtopic                                      | HUM 2.1  | Fatigue   |  |  |     |
| APS<br>HUM 2.1.1                              | State factors that cause fatigue.  | 1         | Shift work<br><br><i>Optional content: night shifts and rosters</i>  |  | ALL |
| APS<br>HUM 2.1.2                              | Describe the onset of fatigue.   | 2         | <i>Optional content: Lack of concentration, Listlessness, Irritability, Frustration, ICAO Circular 241 – AN/145 Human factors in Air Traffic Control</i> |  | ALL |
| APS<br>HUM 2.1.3                              | Recognise the onset of fatigue in self.  | 1         | <i>Optional content: ICAO Circular 241 – AN/145 Human factors in Air Traffic Control</i>   |  | ALL |
| APS<br>HUM 2.1.4                              | Recognise the onset of fatigue in others.  | 1         |  |  | ALL |
| APS<br>HUM 2.1.5                              | <del>Describe</del> <del>Consider</del> appropriate action when recognising fatigue. | 2         |  |  | ALL |
| Subtopic                                      | HUM 2.2  | Fitness   |  |  |     |
| APS<br>HUM 2.2.1                              | Recognise signs of lack of personal fitness.   | 1         |  |  | ALL |
| APS<br>HUM 2.2.2                              | Describe actions when aware of a lack of personal fitness.                           | 2         |  |  | ALL |



| TOPIC HUM 3 SOCIAL AND ORGANISATIONAL FACTORS |  |                                |   |  |     |
|---|--|--------------------------------|---|--|-----|
| Subtopic                                      | HUM 3.1  | Team resource management (TRM) |   |  |     |
| APS<br>HUM 3.1.1                              | State the <b>relevance objectives</b> of TRM.  | 1                              | Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training                                      |  | ALL |
| APS<br>HUM 3.1.2                              | State the content of the TRM concept.  | 1                              | Optional content: team work, human error, team roles, stress, decision making, communication, situational awareness           |  | ALL |
| Subtopic                                      | HUM 3.2  | Teamwork and team roles        |   |  |     |
| APS<br>HUM 3.2.1                              | Identify reasons for conflict.   | 3                              |   |  | ALL |
| APS<br>HUM 3.2.2                              | Describe actions to prevent human conflicts.   | 2                              | Optional content: TRM team roles  |  | ALL |
| APS<br>HUM 3.2.3                              | Describe strategies to cope with human conflicts.  | 2                              | Optional content: in your team, in the simulator  |  | ALL |
| Subtopic                                      | HUM 3.3  | Responsible behaviour          |   |  |     |
| APS<br>HUM 3.3.1                              | Consider the factors which influence responsible behaviour.  | 2                              | Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality |  | ALL |
| APS<br>HUM 3.3.2                              | Apply responsible judgement.   | 3                              | Case study and discussion about a dilemma situation   |  | ALL |
| TOPIC HUM 4 STRESS                            |  |                                |   |  |     |
| Subtopic                                      | HUM 4.1  | Stress                         |   |  |     |
| APS<br>HUM 4.1.1                              | Recognise the effects of stress on performance.  | 1                              | Stress and its symptoms in self and in others   |  | ALL |
| Subtopic                                      | HUM 4.2  | Stress management              |   |  |     |
| APS<br>HUM 4.2.1                              | Act to reduce stress.  | 3                              | The effect of personality in coping with stress, The benefits of active stress management                                     |  | ALL |
| APS<br>HUM 4.2.2                              | Respond to stressful situation by offering, asking or accepting assistance. Obtain assistance in stressful situations. | 3                              | Optional content: The benefits of offering, accepting and asking for help in stressful situations                             |  | ALL |
| APS<br>HUM 4.2.3                              | Recognise the effect of shocking and stressful events.   | 1                              | Self and others, Abnormal situations, CISM  |  | ALL |

|                  |  |   |   |     |
|------------------|--|---|---|-----|
| APS<br>HUM 4.2.4 | Consider the benefits of Critical Incident Stress Management (CISM). | 2 |   | ALL |
| APS<br>HUM 4.2.5 | Explain procedures used following an incident/accident.              | 2 | <i>Optional content: CISM, Counselling, Human element</i> | ALL |

## TOPIC HUM 5 HUMAN ERROR

| Subtopic         | HUM 5.1  | Human error        |  |     |
|------------------|--|--------------------|--|-----|
| APS<br>HUM 5.1.1 | Explain the relationship between error and safety.                               | 2                  | Number and combination of errors, proactive versus reactive approach to discovery of error<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |
| APS<br>HUM 5.1.2 | Differentiate between the types of error.  | 2                  | <b>Slips, Lapses, Mistakes</b><br><br><i>Optional content: <del>Slips, Lapses, Mistakes</del> ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>                          | ALL |
| APS<br>HUM 5.1.3 | Describe error-prone conditions.   | 2                  | <i>Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences</i>  | ALL |
| APS<br>HUM 5.1.4 | Collect examples of different error types, their causes and consequences in ATC. | 3                  | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| APS<br>HUM 5.1.5 | Explain how to detect errors to compensate for them.                             | 2                  | <b>STCA, MSAW, individual and collective strategy</b><br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>                                      | ALL |
| APS<br>HUM 5.1.6 | Execute corrective actions.  | 3                  | <b>Error compensation</b><br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>  | ALL |
| APS<br>HUM 5.1.7 | <b>Explain the importance of error management.</b>                               | 2                  | <i>Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practises</i>  | ALL |
| APS<br>HUM 5.1.8 | <b>Describe the impact on an ATCO following an occurrence/incident.</b>          | 2                  | <i>Optional content: reporting, SMS, investigation, CISM</i>   | ALL |
| Subtopic         | HUM 5.2  | Violation of rules |  |     |

|                  |   |   |  |     |
|------------------|---|---|--|-----|
| APS<br>HUM 5.2.1 | Explain the causes and dangers of violation of rules becoming accepted as a practice. | 2 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |
|------------------|---|---|--|-----|

## TOPIC HUM 6 **WORKING METHODS**

| Subtopic         | HUM 6.1  | Efficiency |   |     |
|------------------|--|------------|---|-----|
| APS<br>HUM 6.1.1 | <del>Consider, from a human factors point of view, the factors affecting efficiency in the provision of air traffic control.</del> | 2          | <del>Optional content: Own and others workload, OT, customer requirements, economy, ecology, safety</del> | ALL |

## TOPIC HUM 6 **COLLABORATIVE WORK**

| Subtopic                      | HUM 6.1  | Communication  |   |     |
|-------------------------------|--|--|---|-----|
| APS<br>HUM 6.1.1<br>8.1.1     | Use communication effectively in ATC.  | 3  |   | ALL |
| APS<br>HUM 6.1.2<br>2.1.3 ATM | Analyse examples of pilot and controller communication for effectiveness.                                    | 4  |   | ALL |
| Subtopic                      | HUM 6.2  | Collaborative work within the same area of responsibility    |   |     |
| APS<br>HUM 6.2.1<br>8.2.1     | List communication means between controllers in charge of the same area of responsibility (sector or tower). | 1  | <i>Optional content: Electronic, written, verbal and non-verbal communication</i>     | ALL |
| APS<br>HUM 6.2.2<br>8.2.2     | Explain consequences of the use of communication means on effectiveness.                                     | 2  | <i>Optional content: Strips legibility and encoding, labels designation, Feedback</i> | ALL |
| APS<br>HUM 6.2.3<br>8.2.3     | List possible actions to provide a safe position handover.   | 1  | <i>Optional content: rigour, preparation, overlap time</i>                            | ALL |
| APS<br>HUM 6.2.4<br>8.2.4     | Explain consequences of a missed position handover process.  | 2  |   | ALL |
| Subtopic                      | HUM 6.3  | Collaborative work between different areas of responsibility |   |     |
| APS<br>HUM 6.3.1<br>8.3.1     | List factors and means for an effective coordination between sectors and/or tower positions.                 | 1  | <i>Optional content: Other sectors constraints, electronic coordination tools</i>     | ALL |
| Subtopic                      | HUM 6.4  | Controller / pilot cooperation                               |   |     |

|  |  |   |   |     |
|--|--|---|---|-----|
| APS<br>HUM 6.4.1<br>8.4.1                            | Describe parameters affecting controller/pilot cooperation.  | 2 | <i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>                             | ALL |
| <b>TOPIC HUM 7 WORKING KNOWLEDGE</b>                 |  |   |   |     |
| <b>Subtopic HUM 7.1 Controller knowledge</b>         |  |   |   |     |
| APS<br>HUM 7.1.1<br>1.1.2 LAW                        | Explain how to maintain and update professional knowledge to retain competence in the operational environment. | 2 | <del><i>Optional content: Briefing, LOAs, NOTAM, AICs, Reports of accident/incident, VOLMET, ATIS, SIGMET</i></del> | ALL |
| <b>TOPIC HUM 9 WORK ENVIRONMENT</b>                  |  |   |   |     |
| <b>Subtopic HUM 9.1 Ergonomics</b>                   |  |   |   |     |
| APS<br>HUM 9.1.1                                     | <del>Appreciate the impact of working position ergonomics on controller activity.</del>                        | 3 |   | ALL |
| <b>TOPIC HUM 10 ATC SAFETY MANAGEMENT</b>            |  |   |   |     |
| <b>Subtopic HUM 10.1 Experience feedback</b>         |  |   |   |     |
| APS<br>HUM 10.1.1<br>3.1.1 LAW                       | State the importance of the controllers contribution to the experience feedback process.                       | 1 | <i>Optional content: voluntary reporting</i>  | ALL |
| APS<br>HUM 10.1.2<br>3.1.2 LAW                       | Describe how reported occurrences are analysed.  | 2 | <del><i>Optional content: ESARR2, local procedures</i></del>  | ALL |
| APS<br>HUM 10.1.3<br>3.1.3 LAW                       | Name the means used to disseminate recommendations.  | 1 | <del><i>Optional content: Safety letters, safety boards web pages</i></del>   | ALL |
| APS<br>HUM 10.1.4<br>3.1.4 LAW                       | Explain the "Just Culture" concept.  | 2 | <del>benefits, prerequisites, constraints</del><br><i>Optional content: EAM 2 GUI 6, GAIN Report</i>                | ALL |
| <b>Subtopic HUM 10.2 Safety investigation branch</b> |  |   |   |     |
| APS<br>HUM 10.2.1<br>3.2.1 LAW                       | Describe role and mission of Safety Investigation Branch in the improvement of safety.                         | 2 |   | ALL |
| APS<br>HUM 10.2.2<br>3.2.2 LAW                       | Define working methods of Safety Investigation Branch.   | 1 |   | ALL |

## Subject 8 : EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall ~~i~~ integrate knowledge and understanding of the basic working principles of equipment and systems and ~~ii~~ comply with the equipment and system degradation procedures in the provision of ATS.

### TOPIC EQPS 1 VOICE COMMUNICATIONS

| Subtopic          | EQPS 1.1   | Radio communications       |   |                          |
|-------------------|--|----------------------------|---|--------------------------|
| APS<br>EQPS 1.1.1 | Operate two-way communication equipment.                       | 3                          | Transmit/receive switches, Procedures<br><br>Optional content: Frequency selection, Standby equipment                                   | ALL                      |
| APS<br>EQPS 1.1.2 | Identify indications of operational status of radio equipment. | 3                          | Optional content: Indicator lights, Serviceability displays, Selector/frequency displays  | ALL                      |
| APS<br>EQPS 1.1.3 | Consider radio range.  | 2                          | Optional content: Transfer to another frequency, Apparent radio failure, Failure to establish radio contact, Frequency protection range | APP<br>ACP<br>APS<br>ACS |
| Subtopic          | EQPS 1.2   | Other voice communications |   |                          |
| APS<br>EQPS 1.2.1 | Operate landline communications.                               | 3                          | Optional content: telephone, interphone and intercom equipment  | ALL                      |

### TOPIC EQPS 2 AUTOMATION IN ATS

| Subtopic          | EQPS 2.1   | Aeronautical fixed telecommunication network (AFTN) |  |                          |
|-------------------|--|---|--|--------------------------|
| APS<br>EQPS 2.1.1 | Decode AFTN messages.                                  | 3   | Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.     | ALL                      |
| Subtopic          | EQPS 2.2   | Automatic data Interchange                          |  |                          |
| APS<br>EQPS 2.2.1 | Use automatic data transfer equipment where available. | 3   | Optional content: Sequencing systems, Automated information and coordination, OLDI | ADV<br>ADI<br>APS<br>ACS |

### TOPIC EQPS 3 CONTROLLER WORKING POSITION

| Subtopic          | EQPS 3.1  | Operation and monitoring of equipment |  |     |
|-------------------|---|---------------------------------------|--|-----|
| APS<br>EQPS 3.1.1 | Monitor the technical integrity of the controller working position. | 3                                     | Notification procedures, Responsibilities  | ALL |
| APS<br>EQPS 3.1.2 | Operate the equipment of the controller working position.           | 3                                     | Optional content: Situation displays, Flight progress board, Flight data display, Radio, Telephone, Maps and charts, Strip-printer, Clock, Information systems monitors, (ECIS), UDF/VDF | ALL |

|   |  |   |  |                          |
|---|--|---|--|--------------------------|
| APS<br>EQPS 3.1.3   | Operate <del>all</del> available equipment in <del>unusual/degraded/abnormal</del> and emergency situations. | 3 |  | ALL                      |
| <b>Subtopic EQPS 3.2 Situation displays and information systems</b>   |  |   |  |                          |
| APS<br>EQPS 3.2.1   | Use situation displays.  | 3 |  | ALL                      |
| APS<br>EQPS 3.2.2   | Check availability of information material.  | 3 |  | ALL                      |
| APS<br>EQPS 3.2.3   | Obtain information from equipment.   | 3 |  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic EQPS 3.3 Flight data systems</b>                          |  |   |  |                          |
| APS<br>EQPS 3.3.1   | Use the flight data information at controller working position.  | 3 |  | ALL                      |
| <b>Subtopic EQPS 3.4 Use of ATS surveillance system</b>               |  |   |  |                          |
| APS<br>EQPS 3.4.1   | Use the ATS surveillance system functions.   | 3 |  | APS<br>ACS               |
| APS<br>EQPS 3.4.2   | Analyse the information provided by the ATS surveillance system.   | 4 |  | APS<br>ACS               |
| APS<br>EQPS 3.4.3   | Assign codes.  | 4 |  | APS<br>ACS               |
| APS<br>EQPS 3.4.4   | Appreciate the use of advanced surveillance technology.  | 3 | Optional content: Mode S, ADS-B, MLAT                            | APS<br>ACS               |
| <b>Subtopic EQPS 3.5 Advanced systems</b>                             |  |   |  |                          |
| APS<br>EQPS 3.5.1   | Appreciate the use of controller pilot datalink communications when available.                               | 3 |  | APS<br>ACS               |
| APS<br>EQPS 3.5.2   | Appreciate the use of information provided by advanced systems.  | 3 | Optional content: trajectory-based information, MTCD, MONA, etc. | APS<br>ACS               |
| <b>TOPIC EQPS 4 FUTURE EQUIPMENT</b>                                  |  |   |  |                          |
| <b>Subtopic EQPS 4.1 New developments</b>                             |  |   |  |                          |
| APS<br>EQPS 4.1.1   | Recognise future developments.   | 1 | New advanced systems   | ALL                      |
| <b>TOPIC EQPS 5 EQUIPMENT AND SYSTEMS LIMITATIONS AND DEGRADATION</b> |  |   |  |                          |

| <b>Subtopic EQPS 5.1 Reaction to limitations</b>             |  |   |   |                                 |
|--|--|---|---|---------------------------------|
| APS<br>EQPS 5.1.1  | Take account of the limitations of equipment and systems.                              | 2 |   | ALL                             |
| APS<br>EQPS 5.1.2  | Respond to technical deficiencies of the operational position.                         | 3 | Notification procedures, Responsibilities   | ALL                             |
| <b>Subtopic EQPS 5.2 Communication equipment degradation</b> |  |   |   |                                 |
| APS<br>EQPS 5.2.1  | Identify that communication equipment has degraded.                                    | 3 | <i>Optional content: Ground-air and landline communications</i>   | APP<br>ACP<br>APS<br>ACS        |
| APS<br>EQPS 5.2.2  | Integrate contingency procedures in the event of communication equipment degradation.  | 3 | Procedures for total or partial degradation of ground-air and landline communications, Alternative methods of transferring data   | APP<br>ACP<br>APS<br>ACS        |
| <b>Subtopic EQPS 5.3 Navigational equipment degradation</b>  |  |   |   |                                 |
| APS<br>EQPS 5.3.1  | Identify when a navigational equipment failure will affect operational ability.        | 3 | <i>Optional content: VOR, Navigational aids</i>   | ALL                             |
| APS<br>EQPS 5.3.2  | Integrate contingency procedures in the event of a navigational equipment degradation. | 3 | <i>Optional content: Vertical separation, Information to aircraft, Navigational assistance, Seeking assistance from adjacent units</i>  | ADI<br>APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic EQPS 5.4 Surveillance equipment degradation</b>  |  |   |   |                                 |
| APS<br>EQPS 5.4.1  | Identify that surveillance equipment has degraded.                                     | 3 | Partial power failure, Loss of certain facilities, Total failure  | APS<br>ACS                      |
| APS<br>EQPS 5.4.2  | Apply contingency procedures in the event of surveillance equipment degradation.       | 3 | <i>Optional content: Inform adjacent sectors, Inform aircraft, Apply vertical separation (emergency), Increased horizontal separation, Reduce the number of aircraft entering area of responsibility, Transfer aircraft to another unit</i> | APS<br>ACS                      |
| <b>Subtopic EQPS 5.5 ATC processing system degradation</b>   |  |   |   |                                 |
| APS<br>EQPS 5.5.1  | Identify a processing system degradation.  | 3 | <i>Optional content: FDPS, SDPS, Software processing of situation display</i>   | APS<br>ACS                      |
| APS<br>EQPS 5.5.2  | Apply contingency procedures in the event of a processing system degradation.          | 3 |   | APS<br>ACS                      |

## Subject 9 : PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

| TOPIC                     | PEN 1   | FAMILIARISATION PROFESSIONAL ENVIRONMENT                                  |  |                          |
|---------------------------|---|---|--|--------------------------|
| Subtopic                  | PEN 1.1   | Study visit to approach control unit                                      |  |                          |
| APS<br>PEN 1.1.1          | Appreciate the functions and provision of an operational approach control service.                | 3   | study visit to an approach control unit  | APP<br>APS               |
| TOPIC                     | PEN 2   | AIRSPACE USERS  |  |                          |
| Subtopic                  | PEN 2.1   | Contributors to civil ATS operations                                      |  |                          |
| APS<br>PEN 2.1.1<br>1.1.1 | Characterise civil <del>and military</del> ATS activities in approach control unit.               | 2   | Study visit to an approach control unit<br><br><i>Optional content: Familiarisation visits to <del>e.g.</del> TWR, APP, ACC, AIS, RCC, Air Defence Units</i> | APP<br>APS               |
| APS<br>PEN 2.1.2<br>1.1.2 | Characterise other parties interfacing with ATS operations.                                       | 2   | <i>Optional content: familiarisation visits to engineering services, fire and emergency services, airline operations offices</i>                             | ALL                      |
| Subtopic                  | PEN 2.2   | Contributors to military ATS operations                                   |  |                          |
| APS<br>PEN 2.2.1<br>1.1.1 | Characterise <del>civil and</del> military ATS activities.  | 2   | <i>Optional content: Familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units</i>  | ALL                      |
| TOPIC                     | PEN 3   | CUSTOMER RELATIONS  |  |                          |
| Subtopic                  | PEN 3.1   | <del>Customer relations</del> Provision of services and user requirements |  |                          |
| APS<br>PEN 3.1.1<br>1.2.1 | Identify the role of ATC as a service provider. <del>and the requirements of the ATS users.</del> | 3   | <i>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</i>         | ALL                      |
| APS<br>PEN 3.1.2<br>1.2.1 | Appreciate ATS users requirements.  | 3   | <i>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</i>         | ALL                      |
| TOPIC                     | PEN 4   | ENVIRONMENTAL PROTECTION  |  |                          |
| Subtopic                  | PEN 4.1   | Environmental protection  |  |                          |
| APS<br>PEN 4.1.1          | Describe the environmental constraints on aerodrome operations.                                   | 2   | <i>Optional content: ICAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions</i>   | ADV<br>ADI<br>APP<br>APS |



|                           |   |   |   |                          |
|---------------------------|---|---|---|--------------------------|
| APS<br>PEN 4.1.2<br>1.3.1 | Explain the use of Collaborative Environmental Management (CEM) process at airports. <del>Describe processes used to ensure environmental protection.</del> | 2 | <del>Optional content: night curfews, relations with local community, relations with environmental associations, relevant administrations</del> | ADV<br>ADI<br>APP<br>APS |
| APS<br>PEN 4.1.3          | Appreciate the mitigation techniques used to minimise aviation's impact on the environment.   | 3 | Optional content: Continuous Descent Operations (CDO), Noise abatement procedures, Noise Preferential Routes, flight efficiency                 | APP<br>APS               |

## Subject 10: ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in ~~unusual, degraded~~-abnormal and emergency situations.

| TOPIC             | ABES       | 1  | UNUSUAL/DEGRADED/ABNORMAL AND EMERGENCY SITUATIONS (ABES) |  |                          |
|-------------------|------------|--|---|--|--------------------------|
| Subtopic          | ABES       | 1.1  | Overview of UNDES ABES                                    |  |                          |
| APS<br>ABES 1.1.1 |            | List common unusual/degraded/abnormal and emergency situations.  | 1   | Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, GPWS ground based safety nets alerts, airframe failure, unreliable instruments, runway incursion | ALL                      |
| APS<br>ABES 1.1.2 |            | Identify potential or actual abnormal and emergency situations.  | 3   |  | ALL                      |
|                   | 4.1.2 ACFT |  |   |  |                          |
| APS<br>ABES 1.1.3 |            | Take into account the procedures for given unusual/degraded/abnormal and emergency situations.                       | 2   | Optional content: ICAO Doc 4444  | APP<br>ACP<br>APS<br>ACS |
|                   | 1.1.2      |  |   |  |                          |
| APS<br>ABES 1.1.4 |            | Take into account that procedures don't exist for all unusual/degraded/abnormal and emergency situations.            | 2   | Optional content: real life examples   | ALL                      |
|                   | 1.1.3      |  |   |  |                          |
| APS<br>ABES 1.1.5 |            | Consider how the evolution of a situation may have an impact on safety.  | 2   | Optional content: Separation, Information, Coordination  | ALL                      |
|                   | 1.1.4      |  |   |  |                          |
| TOPIC             | ABES       | 2  | SKILLS IMPROVEMENT  |  |                          |
| Subtopic          | ABES       | 2.1  | Communication effectiveness                               |  |                          |
| APS<br>ABES 2.1.1 |            | Ensure effective communication in all circumstances including the case where standard phraseology is not applicable. | 4   | Phraseology, Vocabulary, Readback, Silence instruction   | ALL                      |
| APS<br>ABES 2.1.2 |            | Apply change of radiotelephony call sign.  | 3   | ICAO Doc 4444  | ALL                      |
| Subtopic          | ABES       | 2.2  | Avoidance of mental overload                              |  |                          |
| APS<br>ABES 2.2.1 |            | Describe actions to keep the control of the situation.   | 2   | Optional content: sector splitting, holding, flow management, task delegation  | ALL                      |
| APS<br>ABES 2.2.2 |            | Organise priority of actions.  | 4   |  | ALL                      |

|   |  |   |   |     |
|---|--|---|---|-----|
| APS<br>ABES 2.2.3   | Ensure an effective circulation of information.  | 4 | <i>Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.</i>                                 | ALL |
| APS<br>ABES 2.2.4   | Consider asking for help.  | 2 |   | ALL |
| <b>Subtopic ABES 2.3 Air / ground cooperation</b>   |  |   |   |     |
| APS<br>ABES 2.3.1   | Collect appropriate information relevant for the situation.  | 3 |   | ALL |
| APS<br>ABES 2.3.2   | Assist the pilot.  | 3 | <b>Pilot workload</b><br><i>Optional content: Instructions, information, support, human factors, etc.</i>   | ALL |
| <b>TOPIC ABES 3 PROCEDURES FOR UNUSUAL/DEGRADED/ABNORMAL AND EMERGENCY SITUATIONS</b>                     |  |   |   |     |
| <b>Subtopic ABES 3.1 Application of procedures for UNUSUAL/DEGRADED/ABNORMAL AND EMERGENCY SITUATIONS</b> |  |   |   |     |
| APS<br>ABES 3.1.1   | Apply the procedures for given unusual/degraded/abnormal and emergency situations.                     | 3 | <i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, GPWS ground based safety nets alerts, airframe failure</i> | ALL |
| <b>Subtopic ABES 3.2 Radio failure</b>  |  |   |   |     |
| APS<br>ABES 3.2.1   | Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure. | 2 | <b>ICAO Doc 7030</b><br><i>Optional content: military procedures</i>  | ALL |
| APS<br>ABES 3.2.2   | Apply the procedures to be followed when a pilot experiences complete or partial radio failure.        | 3 | <i>Optional content: Prolonged loss of communication</i>  | ALL |
| <b>Subtopic ABES 3.3 Unlawful interference and aircraft bomb threat</b>                                   |  |   |   |     |
| APS<br>ABES 3.3.1   | Apply ATC procedures associated with unlawful interference and aircraft bomb threat.                   | 3 | <b>ICAO Doc 4444</b>  | ALL |
| <b>Subtopic ABES 3.4 Strayed or unidentified aircraft</b>   |  |   |   |     |
| APS<br>ABES 3.4.1   | Apply the procedures in the case of strayed aircraft.  | 3 | <b>ICAO Doc 4444</b><br><i>Optional content: Inside controlled airspace, Outside controlled airspace</i>  | ALL |
| APS<br>ABES 3.4.2   | Apply the procedures in the case of unidentified aircraft.   | 3 | <b>ICAO Doc 4444</b>  | ALL |

| Subtopic ABES 3.5 Diversions          |  |   |  |
|---------------------------------------|--|---|--|
| APS<br>ABES 3.5.1                     | Provide navigational assistance to diverting emergency aircraft. | 4 | Track/heading, Distance, Other navigational assistance<br><br><i>Optional content: Nearest most suitable aerodrome</i> |
|                                       |  |   | APP<br>ACP<br>APS<br>ACS   |
| Subtopic ABES 3.6 Transponder failure |  |   |  |
| APS<br>ABES 3.6.1                     | Apply procedures in the event of an SSR transponder failure.     | 3 | ICAO Doc 4444, ICAO Doc 7030<br><br><i>Optional content: total/partial failure, impact on ADS-B/Mode S capability</i>  |
|                                       |  |   | APS<br>ACS   |

## Subject 11: AERODROMES

The subject objective is:

Learners shall recognise and understand the design and layout of aerodromes.

| TOPIC AGA 1 AERODROME DATA, LAYOUT AND COORDINATION |         |  |   |  |                          |
|---|---------|--|---|--|--------------------------|
| Subtopic  | AGA 1.1 | Definitions  |   |  |                          |
| APS<br>AGA 1.1.1                                    |         | <del>Describe the general layout of an aerodrome with a single runway and multiple runways.</del>            | 2 | <del>ICAO Annex 14</del><br><i>Optional content: AIP</i>   | APP<br>APS<br>ADV<br>ADI |
| APS<br>AGA 1.1.1<br>1.1.2                           |         | Define aerodrome data.   | 1 | ICAO Annex 14<br><i>Optional content: Aerodrome elevation, Reference point, Apron, Movement area, Manoeuvring area, Hot spot</i> | ADV<br>ADI<br>APP<br>APS |
| Subtopic  | AGA 1.2 | Coordination   |   |  |                          |
| APS<br>AGA 1.2.1                                    |         | Identify the information that has to be passed between Air Traffic Services (ATS) and the airport authority. | 3 | Airport conditions, Fire/rescue category, Condition of ground equipment and NAVAIDs, AIRAC, ICAO Annex 14                        | APP<br>APS<br>ADV<br>ADI |
| TOPIC AGA 2 MOVEMENT AREA                           |         |  |   |  |                          |
| Subtopic  | AGA 2.1 | Movement area  |   |  |                          |
| APS<br>AGA 2.1.1                                    |         | Describe movement area.  | 2 | ICAO Annex 14  | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.1.2                                    |         | Describe the marking of obstacles and unusable or unserviceable areas.                                       | 2 | Flags, Signs on pavement, Lights   | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.1.3                                    |         | Identify the information on conditions of the movement area that have to be passed to aircraft.              | 3 | Essential information on aerodrome conditions  | ADV<br>ADI<br>APP<br>APS |
| Subtopic  | AGA 2.2 | Manoeuvring area   |   |  |                          |
| APS<br>AGA 2.2.1                                    |         | Describe manoeuvring area.   | 2 | ICAO Annex 14  | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.2.2                                    |         | Describe taxiway.  | 2 |  | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.2.3                                    |         | Describe the daylight marking on taxiways.   | 2 |  | ADV<br>ADI<br>APP<br>APS |

|                                 |  |   |  |                          |
|---------------------------------|--|---|--|--------------------------|
| APS<br>AGA 2.2.4                | Describe taxiway lighting.                                       | 2 |  | ADV<br>ADI<br>APP<br>APS |
| <b>Subtopic AGA 2.3 Runways</b> |  |   |  |                          |
| APS<br>AGA 2.3.1                | Describe runway.   | 2 | Runway, Runway surface, Runway strip, Shoulder, Runway end safety areas, Clearways, Stopways   | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.2                | Describe instrument runway.                                      | 2 | ICAO Annex 14  | ADI<br>APP<br>APS        |
| APS<br>AGA 2.3.3                | Describe non-instrument runway.                                  | 2 | ICAO Annex 14  | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.4                | Explain declared distances.                                      | 2 | TORA, TODA, ASDA, LDA  | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.5                | Explain the differences between ACN and PCN.                     | 2 | Strength of pavements  | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.6                | Describe the daylight markings on runways.                       | 2 | <i>Optional content: Runway Designator, Centre line, Threshold, Aiming point, Fixed distance, Touchdown zone, Side strip, Colour</i> | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.7                | Describe runway lights.  | 2 | <i>Optional content: Colour, Centre line, Intensity, Edge, Touchdown zone, Threshold, Barettes</i>                                   | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.8                | Explain the functions of visual landing aids.                    | 2 | <i>Optional content: AVASI, VASI, PAPI</i>   | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.9                | Describe the approach lighting systems.                          | 2 | Centre line, cross bars, Stroboscopic lights, Colours, Intensity and brightness  | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.10               | Characterise the effect of water/ice on runways.                 | 2 |  | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.11               | Explain braking action.  | 2 | Braking action coefficient   | ADV<br>ADI<br>APP<br>APS |
| APS<br>AGA 2.3.12               | Explain the effect of runway visual range on aerodrome operation | 2 |  | ADV<br>ADI<br>APP<br>APS |

## TOPIC AGA 3 OBSTACLES

### Subtopic AGA 3.1 Obstacle-free airspace around aerodromes

|  |                |   |   |   |                          |
|--|----------------|---|---|---|--------------------------|
| APS  | AGA 3.1.1      | Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes. | 2 |   | ADV<br>ADI<br>APP<br>APS |
| <b>TOPIC AGA 4 MISCELLANEOUS EQUIPMENT</b> |                |   |   |   |                          |
| <b>Subtopic</b>                            | <b>AGA 4.1</b> | <b>Location</b>   |   |   |                          |
| APS  | AGA 4.1.1      | Explain the location of different aerodrome ground equipment.                                       | 2 | <i>Optional content: LLZ, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI</i> | ADV<br>ADI<br>APP<br>APS |

## Supplements

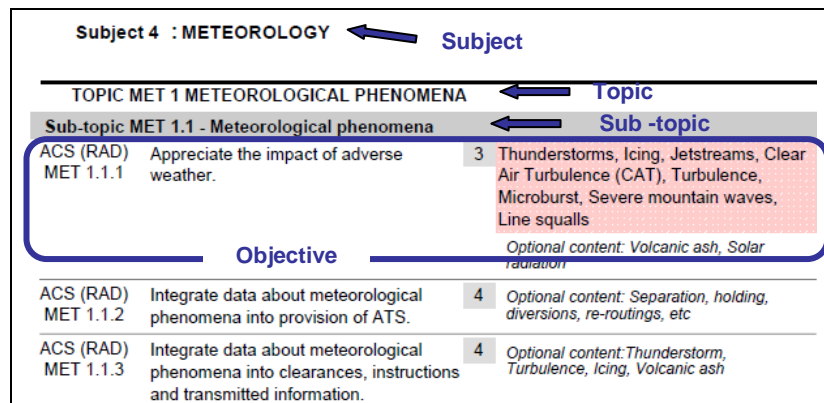


## Supplement 1

### SYLLABI STRUCTURE - HOW TO READ THE TABLES

#### 1. Structure of the Rating training syllabi

- a. Each Rating training has been structured as a syllabus, as follows:
  - i. Each syllabus is divided into subjects, which are divided into topics that are in turn divided into sub-topics. This structure is used to create and classify the objectives. There can be one or several objectives linked to each sub-topic.
  - ii. Objectives are assigned to a specific subject which deals with the knowledge and skills needed to accomplish the subject objective contained in Appendix 8 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(v) Approach Control Surveillance Rating — APS)



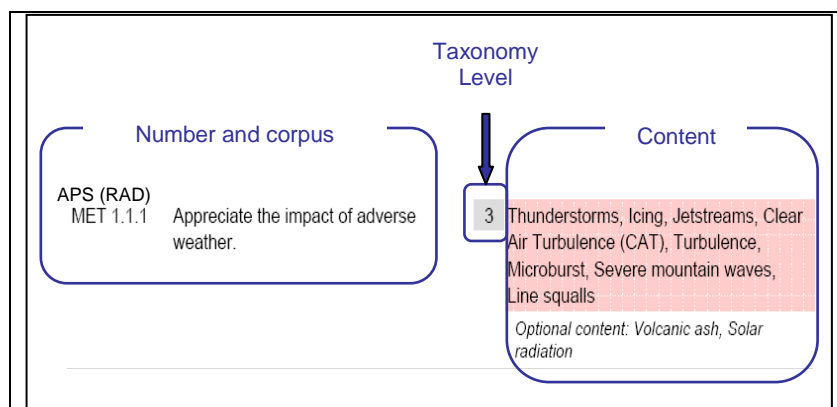
**Figure 1: Layout of syllabus**

- b. The following principles may be applied to the development of a training course that is based on any of the syllabi:
  - i. The structure of the syllabi and the order of the objectives contained within Appendix 8 to Regulation (EU) No .../... is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.
  - ii. No objective from the Basic syllabus is repeated as 'a refresher' in the Rating syllabi.
  - iii. The number of objectives contained within a sub-topic does not necessarily signify how long it should take to teach that sub-topic. For example, a sub-topic containing five relatively straightforward objectives, may take a shorter time to be taught than another sub-topic containing two complex objectives.

#### 2. Structure of objectives

- a. An objective consists of three elements:
  - i. The corpus, which is a description of the required performance. It always contains an action verb to ensure that the outcome is observable. The action verb is always associated with a defined taxonomy.

- ii. The level, which indicates numerically the taxonomy of the action verb.
- iii. The content, which may be implicit or explicit. The explicit content is written in the content field, while the implicit content is not but, instead, is implied in the corpus of the objective and other elements (syllabus, subject, etc.). Content that is a required part of the objective is written in the red shaded field. Optional content, written in italics, may be used if considered appropriate.



**Figure 2: Layout of an objective**

### 3. Repeated and common objectives

- a. Repeated and common objectives are only applicable to Rating training.
- b. To the right of each objective there is an indication of which other ratings contain this particular objective. This indication is the first step to help the training providers in identifying the potential commonalities between the various syllabi. As a second step, the training provider must determine, at the level of local implementation, whether the objective is to be regarded as repeated or common.

| TOPIC MET 1 - METEOROLOGICAL PHENOMENA      |  |   |   |                          |
|---|--|---|---|--------------------------|
| Subtopic MET 1.1 - Meteorological phenomena |  |   |   |                          |
| APS<br>MET 1.1.1                            | Appreciate the impact of adverse weather.                            | 3 | Thunderstorms, Icing, Clear Air Turbulence (CAT), Turbulence, Microburst, Wind shear, Severe mountain waves, Line squalls, Volcanic ash | APP<br>APS               |
| APS<br>MET 1.1.2                            | Integrate data about meteorological phenomena into provision of ATS. | 4 | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena</i>                      | ALL                      |
| APS<br>MET 1.1.3                            | Use techniques to avoid adverse weather when necessary/possible.     | 3 | Rerouting, level change, etc.   | APP<br>ACP<br>APS<br>ACS |

**Figure 3: Indication of the ratings that particular objective applies to.**

### 3.1 Repeated objectives

- a. All the objectives appearing in a syllabus are implicitly appropriate to this syllabus. As a consequence, objectives may be repeated 'verbatim' in different rating syllabi and nevertheless specify a different performance. The reader always needs to mentally add the sentence 'in this syllabus context' at the end of each objective.

*For example, the objective 'use approved phraseology' is repeated (same level, same corpus, same content) in all the syllabi but is different because the context is different in each syllabus (a learner able to use approved phraseology for en-route traffic will need additional training before mastering the phraseology in the provision of aerodrome control).*

### 3.2 Common objectives

- a. Common objectives are verbatim the same objectives that appear in more than one rating syllabi in the same context so that they do not need to be taught again in case of combined or successively organised courses.

*For example, the objective 'describe the human information processing model' is common for all the syllabi because the context is non-specific and is therefore not determined by the type of rating.*

- b. As a general principle, the rating subject Human Factors is identical in each Rating training syllabi and can be considered as containing common objectives because the context is always the same. This means that the rating training objectives relating to Human Factors need only be taught once. If a learner is acquiring an additional rating, he/she would not be required to repeat the Human Factors objectives.

#### 4. Action verbs that support the Taxonomy for training objectives:

a. The five taxonomy levels should be understood to have the following levels of complexity:

b. Action verbs for Level 1

Level 1 - A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

| L1 Verb          | Definition   | Example  |
|------------------|--|--|
| <b>Define</b>    | State what it is and what its limits are; state the definition | Define ATC service   |
| <b>Draw</b>      | Produce a picture, pattern or diagram                          | Draw the block diagram<br>Draw a holding pattern   |
| <b>List</b>      | Say one after the other  | List the main structure components of an aircraft  |
| <b>Name</b>      | Give name of objects or procedures                             | Name the components of an ILS<br>Name the key national and international aviation organisations. |
| <b>Quote</b>     | Repeat of what is written or said to underline                 | Quote ICAO definition of ATC service   |
| <b>Recognise</b> | To know what it is because you've seen it before               | Recognise the information contained in the different parts of the AIP.                           |
| <b>State</b>     | Say or write in a formal or definite way                       | State the meteorological hazards to aviation.  |

c. Action verbs for Level 2

Level 2 - The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

| L2 Verb             | Definition  | Example   |
|---------------------|---|---|
| <b>Characterise</b> | To describe the quality of features in something                                  | Characterise the main items of ATC equipment                            |
| <b>Consider</b>     | To think carefully about it   | Consider the benefits of Critical Incident Stress Management (CISM).    |
| <b>Demonstrate</b>  | Describe and explain; logically or mathematically proves the truth of a statement | Demonstrate the importance of good communications in ATC.               |
| <b>Describe</b>     | Say what it is like or what happened  | Describe the methods by which ICAO notifies and implements legislation. |

|                        |   |  |
|------------------------|---|--|
| <b>Differentiate</b>   | Show the differences between things                                   | Differentiate between different types of visibility.   |
| <b>Explain</b>         | Give details about something or describe so that it can be understood | Explain the purpose and function of ICAO   |
| <b>Take account of</b> | Take into consideration before deciding                               | Take into account the wind influence when calculating a ground speed.<br>Take account of the limitations of equipment and systems. |

## d. Action verbs for Level 3

Level 3 - A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

| <b>L3 Verb</b>    | <b>Definition</b>   | <b>Example</b>   |
|-------------------|---|--|
| <b>Act</b>        | Carry out, execute  | Act to reduce stress.  |
| <b>Apply</b>      | Use something in a situation or activity  | Apply separation.  |
| <b>Appreciate</b> | To understand a situation and know what is involved in a problem-solving situation, to state a plan without applying it                                 | Appreciate the necessity for coordination. (The learner says that the coordination will be done and with whom, he/she does not perform the actual coordination). |
| <b>Assist</b>     | Help somebody to do a job by doing part of it   | Assist the pilot   |
| <b>Calculate</b>  | To discover from information you already have by arithmetic; to think about a possible cause of action in order to form an opinion or decide what to do | Calculate appropriate levels<br>Calculate conversions between the three north designations.  |
| <b>Check</b>      | Make sure the information is correct (satisfactory)   | Check the accuracy of flight data information<br>Check availability of information material.   |
| <b>Choose</b>     | Select out of number, decide to do one thing rather than another  | Choose appropriate levels.<br>Choose which aircraft should be vectored   |
| <b>Collect</b>    | Assemble, accumulate, bring or come together  | Collect examples of different types of error, their causes and consequences in ATC.  |
| <b>Conduct</b>    | Lead, guide   | Conduct coordination   |
| <b>Confirm</b>    | Establish more firmly, corroborate  | Confirm sequence order   |
| <b>Decode</b>     | Turn into ordinary writing, decipher  | Decode the content of weather reports and forecast   |
| <b>Encode</b>     | Put into code or cipher   | Encode and decode flight plans (including supplementary information).  |
| <b>Estimate</b>   | Form an approximate judgement of a number, form an opinion  | Estimate distance and direction between two points   |
| <b>Execute</b>    | Perform action  | Execute corrective actions.  |
| <b>Extract</b>    | Copy out, make extracts   | Extract pertinent data from relevant sources to produce a flight progress  |

Page 7 of 17

| L3 Verb         | Definition  | Example   |
|-----------------|---|---|
|                 | from, find, deduce  | display.  |
| <b>Identify</b> | Associate oneself inseparably with, establish the identity  | Identify the role of ATC as a service provider and the requirements of the ATS users.<br>Identify an aircraft |
| <b>Inform</b>   | Inspire, tell   | Inform supervisor of situation.   |
| <b>Initiate</b> | Begin, set going, originate   | Initiate appropriate coordination   |
| <b>Input</b>    | Enter in the system   | Input data  |
| <b>Issue</b>    | Send forth, publish   | Issue appropriate ATC clearances.<br>Issue appropriate traffic information.                                   |
| <b>Maintain</b> | Carry on, keep up, refresh  | Maintain flight data display  |
| <b>Measure</b>  | Ascertain extent or quality of (thing) by comparison with fixed unit or with object of known size | Measure distance on a map   |
| <b>Monitor</b>  | Keep under observation  | Monitor traffic<br>Monitor the effect of human information processing factors on decision making.             |
| <b>Notify</b>   | Make known, announce, report  | Notify runway in use  |
| <b>Obtain</b>   | Acquire easily, without research  | Obtain meteorological information<br>Obtain information from the relieving controller.                        |
| <b>Operate</b>  | Conduct work on equipment   | Operate the equipment of the controller working position.   |
| <b>Pass</b>     | Move, cause to go, transmit   | Pass essential traffic information without delay  |
| <b>Perform</b>  | Carry into effect, go through, execute  | Perform communication effectively   |
| <b>Process</b>  | To put through the steps of a prescribed procedure  | Process pertinent data on data displays.  |
| <b>Record</b>   | Register, set down for remembrance or reference   | Record information by writing effectively   |
| <b>Relay</b>    | Arrange in, provide with, replace by ...  | Relay meteorological information from pilot reports.  |
| <b>Respond</b>  | Make answer, perform answering or corresponding action  | Respond to loss/doubt concerning identification.<br>Respond to distress and urgency messages and signals.     |
| <b>Scan</b>     | Continuously observe rapidly, sequentially and  | Scan data display   |

| L3 Verb         | Definition   | Example  |
|-----------------|--|--|
|                 | selectively in order to extract relevant data                  |  |
| <b>Transfer</b> | Hand over  | Transfer information to the relieving controller                       |
| <b>Update</b>   | Refresh, bring up-to-date                                      | Update the data display to accurately reflect the traffic situation.   |
| <b>Use</b>      | Employ for a purpose, handle as instrument, put into operation | Use approved phraseology.<br>Use the available means for coordination. |
| <b>Verify</b>   | Establish truth of   | Verify the mode C information  |

## e. Action verbs for Level 4

Level 4 - Ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problem situation. This involves the integration of known applications in a familiar situation.

| L4 Verb           | Definition   | Example   |
|-------------------|--|---|
| <b>Acquire</b>    | Gain by oneself and for oneself, obtain after research | Acquire relevant aeronautical information   |
| <b>Adjust</b>     | Change to a new position, value or setting             | Adjust the surveillance system display  |
| <b>Allocate</b>   | Assign, devote   | Allocate levels (height, altitude, flight level) according to altimetry data.   |
| <b>Analyse</b>    | Examine minutely the constitution of                   | Analyse examples of pilot and controller communication for effectiveness.<br>Analyse the information provided by the radar equipment. |
| <b>Assign</b>     | Allot as a share, make over                            | Assign codes.   |
| <b>Coordinate</b> | Bring part into proper relation                        | Coordinate runway in use.<br>Coordinate in the provision of FIS.  |
| <b>Comply</b>     | Act in accordance with                                 | Comply with rules   |
| <b>Delegate</b>   | Commit authority to somebody                           | Delegate separation to pilots in the case of aircraft executing successive visual approaches.   |
| <b>Detect</b>     | Discover existence of                                  | Detect potential conflict   |
| <b>Ensure</b>     | Make safe, make certain                                | Ensure the agreed course of action is carried out   |
| <b>Expedite</b>   | Assist the progress of, do speedily                    | Expedite traffic  |



| L4 Verb          | Definition  | Example  |
|------------------|---|--|
| <b>Integrate</b> | Combine into a whole, complete by addition of parts         | Integrate appropriate ATC clearances in control service.   |
| <b>Manage</b>    | Handle, wield, conduct                                      | Manage traffic on the manoeuvring area.<br>Manage traffic in accordance with procedural changes. |
| <b>Organise</b>  | Give orderly structure to, frame and put into working order | Organise pertinent data on data displays.<br>Organise priority of actions.                       |
| <b>Predict</b>   | Forecast  | Predict positions of aircraft in the aerodrome traffic and taxi circuits.                        |
| <b>Provide</b>   | Supply, furnish   | Provide radar separation.<br>Provide FIS.  |
| <b>Relate</b>    | Establish link with   | Relate a pressure setting to an altitude   |

## f. Action verbs for Level 5

Level 5 - Ability to analyse new situation in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different from those previously met, requiring judgement and evaluation of options.

| L5 verb          | Definition   | Example   |
|------------------|--|---|
| <b>Assess</b>    | Estimate value or difficulty, evaluate, appraise                                     | Assess workload   |
| <b>Balance</b>   | Weigh (a question, two arguments, etc., against each other)                          | Balance the workload with the traffic demand.   |
| <b>Discuss</b>   | Investigate by reasoning or argument   | Discuss the impact of regulation.   |
| <b>Evaluate</b>  | Ascertain amount of, find numerical expression for                                   | Evaluate the necessary information to be provided to pilots in need of navigational assistance. |
| <b>Interpret</b> | To decide on something's meaning or significance when there is a choice              | Interpret operational information.  |
| <b>Optimise</b>  | To make optimal; get the most out of; use best; modify to achieve maximum efficiency | Optimise the use of support tools.  |
| <b>Resolve</b>   | Solve, clear up, settle  | Resolve conflict  |
| <b>Select</b>    | Pick out as best or most suitable  | Select the runway in use  |

| L5 verb         | Definition   | Example  |
|-----------------|--|--|
| <b>Theorise</b> | Extract general principles from a particular experience                    | Theorise the resolution of conflict between a slow and a fast aircraft |
| <b>Validate</b> | Make valid, ratify, prove valid, show or confirm the validity of something | Validate one radar vectoring option to expedite the traffic            |

g. Application of taxonomy levels to practically-based objectives

- i. Objectives at taxonomy level 3 or higher, which are of a practical nature, related to all subjects except ATM, may be achieved by any suitable type of practical training methods e.g. hands on, plotting on charts, etc.
- ii. Objectives at taxonomy level 3 or higher, for the ATM subject (Basic and Rating), are practical by nature and require the integration of several knowledge areas and skills at the same time, e.g. vectoring of an aircraft requires knowledge and skills in the areas of radio telephony, aircraft performance, navigation and radar theory. Therefore, ATM level 3 objectives should be achieved through the use of a part task trainer or a simulator.
- iii. ATM level 4 objectives should be achieved for the most part through the use of a simulator. A part task trainer, which presents operational situations at an enforced pace, may be used to achieve some ATM level 4 objectives.
- iv. ATM level 5 objectives should be achieved through the use of a simulator.

-----

## Supplement 2

### Abbreviations

For the purposes of these AMCs, the following abbreviations and acronyms shall apply:

| Abbreviation | Meaning  |
|--------------|--|
| ABAS         | Aircraft-based Augmentation System (EGNOS)   |
| ACAS         | Airborne Collision Avoidance System  |
| ACC          | Area Control Centre  |
| ACP          | Area Control Procedural Rating   |
| ACFT         | Aircraft (subject)   |
| ACN          | Aircraft Classification Number   |
| ACS          | Area Control Surveillance Rating   |
| ADF          | Automatic Direction Finding System   |
| ADI          | Aerodrome Control Instrument   |
| ADS          | Automatic Dependent Surveillance   |
| ADV          | Aerodrome Control Visual Rating  |
| ADVS         | Advisory Service   |
| AEA          | Association of European Airlines   |
| AFIL         | Air Filed Flight Plan  |
| AFTN         | Aeronautical fixed telecommunication network   |
| AGA          | Aerodromes   |
| AIC          | Aeronautical Information Circular  |
| AIP          | Aeronautical Information Publication   |
| AIRAC        | Aeronautical Information Regulation and Control  |
| AIRAC SUP    | AIRAC Supplement   |
| AIREP        | Air-Report   |
| AIRMET       | Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations |
| AIS          | Aeronautical Information Service   |
| ALRS         | Alerting Service   |
| AMC          | Acceptable Means of Compliance   |
| APM          | Approach Path Monitor  |
| APP          | Approach Control / Centre / Procedural Rating  |
| APS          | Approach Control Surveillance Rating   |
| APV          | Approach Procedure with Vertical guidance  |
| APW          | Area Proximity Warning   |
| ASDA         | Accelerate Stop Distance Available   |

|         |  |
|---------|--|
| ASM     | Airspace Management  |
| ASMGCS  | Advanced Surface Movement Guidance and Control Systems               |
| ATC     | Air Traffic Control  |
| ATCEUC  | Air Traffic Controllers European Unions Co-ordination                |
| ATCO    | Air Traffic Controller   |
| ATCS    | Air Traffic Control Service  |
| ATFCM   | Air Traffic Flow and Capacity Management                             |
| ATFM    | Air Traffic Flow Management  |
| ATIS    | Automatic Terminal Information Service                               |
| ATM     | Air Traffic Management   |
| ATS     | Air Traffic Services   |
| ATZ     | Aerodrome Traffic Zone   |
| AVASI   | Advanced Visual Approach Slope Indicator                             |
| B-RNAV  | Basic Area Navigation  |
| BIRDTAM | Bird hazard NOTAM (NOTAM reporting bird hazard)                      |
| CANSO   | Civil Air Navigation Services Organisation                           |
| CAT     | Clear Air Turbulence   |
| CBA     | Cross Border Area  |
| CBT     | Computer Based Training  |
| CCIS    | Closed Circuit Information System                                    |
| CDR     | Conditional Route  |
| CISM    | Critical Incident Stress Management                                  |
| CPDLC   | Controller Pilot Data Link Communications                            |
| CPL     | Current Flight Plan  |
| D-GPS   | Differential Global Positioning System                               |
| DFTI    | Distance from Touchdown Indicator                                    |
| DME     | Distance Measuring Equipment   |
| Doc     | Document   |
| EAM     | ESARR Advisory Material  |
| EASA    | European Aviation Safety Agency                                      |
| EAT     | Expected Approach Time   |
| EATCHIP | European Air Traffic Control Harmonisation and Integration Programme |
| EATMP   | European Air Traffic Management Programme                            |
| EC      | European Commission  |
| ECAC    | European Civil Aviation Conference                                   |
| EET     | Estimated Elapsed Time   |
| EFIS    | Electronic Flight Instrument System                                  |

|             |  |
|-------------|--|
| EGNOS       | European Geostationary Overlay Service                           |
| EQPS        | Equipment and Systems (subject)                                  |
| ESARR       | Eurocontrol Safety Regulatory Requirements                       |
| ETF         | European Transport Workers' Federation                           |
| EUROCONTROL | European Organisation for the Safety of Air Navigation           |
| FAB         | Functional Airspace Block  |
| FDPS        | Flight Data Processing System                                    |
| FIR         | Flight Information Region  |
| FIS         | Flight Information Service                                       |
| FMS         | Flight Management System   |
| FPB         | Flight Progress Board  |
| FPL         | Flight Plan  |
| FUA         | Flexible Use of Airspace   |
| GAIN Report | Global Aviation Information Network Report                       |
| GBAS        | Ground Based Augmentation System                                 |
| GLONASS     | Global Orbiting Navigation Satellite System                      |
| GNSS        | Global Navigation Satellite System                               |
| GP          | Glide Path   |
| GPS         | Global Positioning System  |
| GPWS        | Ground Proximity Warning System                                  |
| GUI         | Guidelines   |
| HBK         | Handbook   |
| HF          | High Frequency   |
| HUM         | Human Factors (subject)  |
| IACA        | International Air Carrier Association                            |
| IAOPA       | International Council of Aircraft Owner and Pilot Associations   |
| IATA        | International Air Transport Association                          |
| ICAO        | International Civil Aviation Organisation                        |
| IFALPA      | International Federation of Airline Pilots Association           |
| IFATCA      | International Federation of Air Traffic Controllers Associations |
| IFPS        | Integrated Initial Flight Plan Processing System                 |
| IFR         | Instrument Flight Rules  |
| ILS         | Instrument Landing System  |
| IMC         | Instrument Meteorological Conditions                             |
| INS         | Inertial Navigation System                                       |
| INTR        | Introduction to the course (subject)                             |
| IRS         | Inertial Reference System  |
| IRVR        | Instrument Runway Visual Range                                   |

|        |   |
|--------|---|
| ISA    | International Standard Atmosphere                 |
| ITU    | International Telecommunications Union            |
| LAW    | Aviation Law (subject)                            |
| LDA    | Landing Distance Available                        |
| LLZ    | Localizer   |
| LNAV   | Lateral Navigation                                |
| LOA    | Letter of Agreement                               |
| LPV    | Lateral Precision with Vertical guidance approach |
| MET    | Meteorology                                       |
| METAR  | Meteorological Aviation Routine Weather Report    |
| MLS    | Microwave Landing System                          |
| Mode A | SSR identification code                           |
| Mode C | SSR Mode C (Pronounced: Mode Charlie)             |
| Mode S | Mode Select                                       |
| MONA   | Monitoring Aids                                   |
| MSAW   | Minimum Safe Altitude Warning                     |
| MTCD   | Medium Term Conflict Detection                    |
| MWO    | Meteorological Watch Office                       |
| NAV    | Navigation (subject)                              |
| NAVAID | Navigation(al) Aid                                |
| NDB    | Non-Directional Beacon                            |
| No.    | Number  |
| NOTAM  | Notice to Airmen                                  |
| OJT    | On the Job Training                               |
| OLDI   | On-Line Data Interchange                          |
| P-RNAV | Precision Area Navigation                         |
| PANS   | Procedures for Air Navigation Services            |
| PAPI   | Precision Approach Path Indicator                 |
| PAR    | Precision Approach Radar                          |
| PBN    | Performance Based Navigation                      |
| PCN    | Pavement Classification Number                    |
| PEN    | Professional Environment (subject)                |
| PSR    | Primary Surveillance Radar                        |
| PTP    | Part Time Practice                                |
| QDM    | Magnetic Heading                                  |
| QDR    | Magnetic Bearing                                  |
| QFE    | Atmospheric pressure at aerodrome elevation       |
| QNH    | Atmospheric pressure at mean sea level            |

|               |   |
|---------------|---|
| QTF           | The position of the transmitting station according to the bearings taken by the D/F station |
| RAIM          | Receiver Autonomous Integrity Monitoring  |
| RCC           | Rescue Coordination Centre  |
| RDPS          | Radar Data Processing System  |
| RNAV          | Area Navigation   |
| RNP           | Required Navigation Performance   |
| RNP-RNAV      | Required Navigation Performance-Area Navigation   |
| ROC           | Rate of Climb   |
| RPL           | Stored Flight Plan  |
| RTF           | Radio Telephony   |
| RVR           | Runway Visual Range   |
| RVSM          | Reduced Vertical Separation Minimum   |
| SADIS         | Satellite Distribution of World Area Forecast System  |
| SAR           | Search and Rescue   |
| SARPs         | Standards and Recommended Practices (ICAO)  |
| SBAS          | Satellite Based Augmentation System   |
| SELCAL        | Selective Calling   |
| SERA          | Standardised European Rules of the Air  |
| SHELL (model) | Software, Hardware, Environment, Live ware, Live ware Model                                 |
| SID           | Standard Instrument Departure (Route)   |
| SIGMET        | Significant Meteorological Information  |
| SMR           | Surface Movement Radar  |
| SNOWTAM       | NOTAM on SNOW conditions  |
| SPECI         | Aviation Selected Special Weather Report  |
| SRC           | Safety Regulation Commission  |
| SRU           | Safety Regulation Unit  |
| SSR           | Secondary Surveillance Radar  |
| STCA          | Short Term Conflict Alert   |
| SVFR          | Special Visual Flight Rules Flight  |
| TACAN         | UHF Tactical Air Navigation Aid   |
| TAF           | Terminal Area (Aerodrome) Forecast  |
| TCAC          | Tropical Cyclone Advisory Centre  |
| TODA          | Take Off Distance Available   |
| TORA          | Take Off Run Available  |
| TRM           | Team Resource Management  |
| TSA           | Temporary Segregated Area   |
| TWR           | Tower Control Unit (Aerodrome Control Tower)  |

|        |  |
|--------|--|
| UDES   | Unusual Degraded Emergency Situations    |
| UDF    | Ultra High Frequency Direction Finder    |
| UHF    | Ultra High Frequency                     |
| UTC    | Coordinated Universal Time               |
| VAAC   | Volcanic Ash Advisory Centre             |
| VASI   | Visual Approach Slope Indicator          |
| VDF    | Very High Frequency Direction Finder     |
| VFR    | Visual Flight Rules                      |
| VHF    | Very High Frequency                      |
| VMC    | Visual Meteorological Conditions         |
| VNAV   | Vertical Navigation                      |
| VOLMET | Routine Weather Reports Broadcast on VHF |
| VOR    | VHF Omni-directional Radio Range         |
| WAFC   | World Area Forecast Centre               |
| WAFS   | World Area Forecast System               |
| WGS-84 | World Geodetic System 84                 |



**ANNEX 1 - PART-ATCO**  
**SUBPART D - ATCO TRAINING**  
**Section 2 - Initial training requirements for Air Traffic Controllers**

**AMC1 to Appendix 9**  
**Area Control Surveillance Rating (ACS)**

- A. General principles that apply to this AMC are contained in ~~the~~~~its~~ ~~enclosed~~ Supplement ~~1~~~~to~~~~AMC1~~.
- B. ATCO Rating training Area Control Surveillance Rating (ACS) should contain the following ~~subject objectives~~ and training objectives that are associated with the subjects, ~~subject objectives~~, topics and subtopics contained in **Appendix 9 - Area Control Surveillance Rating (ACS)**
- C. Subjects, ~~subject objectives~~, topics and subtopics from ~~the~~Appendix 9 are repeated in this AMC for the convenience of the reader and do not form a part of it.

## NPA -> CRD TRACK CHANGES FILE

This document has been provided to help reviewers make a comparison between the corresponding AMCs to appendices of the NPA 2012-18 (15 Nov 2012) and the CRD (30 Sep 2013) of Licensing and medical certification of air traffic controllers Implementing Rule - Part (B.V) ATCO Initial training requirements.

To decode the changes the following conventions have been used:

**Deleted** information is shown with the ~~strikethrough-effect~~

**Relocated** information is shown with the ~~strikethrough-effect~~

**New** information is shown in ~~blue text~~.

When an existing objective has been relocated (and consequently renumbered) the new number is shown in black to the left of the objective and the original number in red below the new one.

3.2.1 - current objective number (if not modified it is the same as in NPA 2012-18 (B.V)

3.3.3 - old objective number that may have an additional subject indication if moved from one subject to another or B(asic) and R(ating) if moved from one syllabus to another

1.5.3 - new objective number for relocated objectives at its original location that may have an additional indication of a new subject or B(asic) and R(ating) if moved from one syllabus to another

---

**TABLE OF CONTENTS**

|  |    |
|--|----|
| SUBJECT 1: INTRODUCTION TO THE COURSE-----   | 3  |
| SUBJECT 2: AVIATION LAW-----   | 5  |
| SUBJECT 3: AIR TRAFFIC MANAGEMENT-----   | 7  |
| SUBJECT 4: METEOROLOGY-----  | 19 |
| SUBJECT 5: NAVIGATION-----   | 20 |
| SUBJECT 6: AIRCRAFT-----   | 21 |
| SUBJECT 7: HUMAN FACTORS-----  | 23 |
| SUBJECT 8: EQUIPMENT AND SYSTEMS-----  | 29 |
| SUBJECT 9: PROFESSIONAL ENVIRONMENT-----   | 32 |
| SUBJECT 10: <del>UNUSUAL/DEGRADED</del> ABNORMAL AND EMERGENCY<br>SITUATIONS ----- | 34 |
| Supplements -----  | 37 |

## Subject 1 : INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

### TOPIC INTR 1 COURSE MANAGEMENT

| Subtopic          | INTR 1.1  | Course introduction                       |  |     |
|-------------------|---|---|--|-----|
| ACS<br>INTR 1.1.1 | Explain the aims and main objectives of the course.                 | 2   |  | ALL |
| Subtopic          | INTR 1.2  | Course administration                     |  |     |
| ACS<br>INTR 1.2.1 | State course administration.  | 1   |  | ALL |
| Subtopic          | INTR 1.3  | Study material and training documentation |  |     |
| ACS<br>INTR 1.3.1 | Use appropriate documentation and their sources for course studies. | 3   | Optional content: Training documentation, library, CBT library, Web, Learning Management Server        | ALL |
| ACS<br>INTR 1.3.2 | Integrate appropriate information into course studies.              | 4   | Training documentation<br>Optional content: Training documentation, supplementary information, library | ALL |

### TOPIC INTR 2 INTRODUCTION TO THE ATC TRAINING COURSE

| Subtopic          | INTR 2.1  | Course content and organisation |  |     |
|-------------------|---|---------------------------------|--|-----|
| ACS<br>INTR 2.1.1 | State the different training methods applied in the course. | 1                               | Theoretical training, practical training, self-study, types of training events                                   | ALL |
| ACS<br>INTR 2.1.2 | State the subjects of the course and their purpose.         | 1                               |  | ALL |
| ACS<br>INTR 2.1.3 | Describe the organisation of theoretical training.          | 2                               | Optional content: course programme   | ALL |
| ACS<br>INTR 2.1.4 | Describe the organisation of practical training.            | 2                               | Optional content: PTP, Simulation, Briefing, Debriefing, course programme  | ALL |
| Subtopic          | INTR 2.2  | Training ethos                  |  |     |
| ACS<br>INTR 2.2.1 | Recognise the feedback mechanisms available.                | 1                               | Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback | ALL |

---

| Subtopic INTR 2.3 Assessment process |                                  |   |     |
|--------------------------------------|----------------------------------|---|-----|
| ACS                                  | Describe the assessment process. | 2 | ALL |
| INTR 2.3.1                           |                                  |   |     |

---

## Subject 2 : AVIATION LAW

The subject objective is:

Learners shall know, understand and apply the Rules of the Air and the Regulations regarding reporting, airspace and appreciate the Licensing and Competence principles.

### TOPIC LAW 1 ATCO LICENSING / CERTIFICATE OF COMPETENCE

| Subtopic                      | LAW 1.1  | Privileges and conditions |  |     |
|-------------------------------|--|---------------------------|--|-----|
| ACS<br>LAW 1.1.1              | Appreciate the conditions which <del>must</del> shall be met <del>to for the</del> issue <del>an of</del> Area Control Surveillance rating <del>with Radar endorsement</del> . | 3                         | Commission Regulation (EU) <del>on ATCO Licensing No xxx/yyyy 805/2011</del> | ACS |
|                               |  |                           | Optional content: National documents   |     |
| ACS<br>LAW 1.1.2<br>6.1.1 HUM | Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.  | 2                         |  | ALL |
| ACS<br>LAW 1.1.3<br>1.1.2     | Explain the conditions for suspension/revocation of ATCO licence.  | 2                         | Commission Regulation (EU) <del>on ATCO Licensing No xxx/yyyy 805/2011</del> | ALL |

### TOPIC LAW 2 RULES AND REGULATIONS

| Subtopic         | LAW 2.1  | Reports  |  |     |
|------------------|--|----------|--|-----|
| ACS<br>LAW 2.1.1 | List the standard forms for reports.   | 1        | Air traffic incident report<br><br><i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>  | ALL |
| ACS<br>LAW 2.1.2 | Describe the functions of, and processes for, reporting.   | 2        | Reporting culture, Air traffic incident report<br><br><i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>                                | ALL |
| ACS<br>LAW 2.1.3 | Use forms for reporting.   | 3        | Air traffic incident reporting form(s)<br><br><i>Optional content: ICAO Doc 4444 Appendix 4, routine air reports, breach of regulations, watch/log book, records</i>                       | ALL |
| Subtopic         | LAW 2.2  | Airspace |  |     |
| ACS<br>LAW 2.2.1 | Appreciate classes and structure of airspace and their relevance to Area Control Surveillance rating operations. | 3        |  | ACS |
| ACS<br>LAW 2.2.2 | Provide planning, coordination and control actions appropriate to the airspace classification and structure.     | 4        | <i>Optional content: ICAO Annex 2, ICAO Annex 11, International requirements, Civil requirements, Military requirements, Areas of responsibility, Sectorisation, National requirements</i> | ALL |

|  |  |                                    |  |     |
|--|--|------------------------------------|--|-----|
| ACS<br>LAW 2.2.3                         | Appreciate responsibility for terrain clearance.   | 3                                  |  | ALL |
| <b>TOPIC LAW 3 ATC SAFETY MANAGEMENT</b> |  |                                    |  |     |
| <b>Subtopic</b>                          | <b>LAW 3.1</b>   | <b>Experience-Feedback process</b> |  |     |
| ACS<br>LAW 3.1.1<br>10.1.1 HUM           | State the importance of <del>the</del> controllers contribution to the <del>experience</del> feedback process. | 1                                  | Optional content: voluntary reporting  | ALL |
| ACS<br>LAW 3.1.2<br>10.1.2 HUM           | Describe how reported occurrences are analysed.  | 2                                  | Optional content: ESARR 2, local procedures  | ALL |
| ACS<br>LAW 3.1.3<br>10.1.3 HUM           | Name the means used to disseminate recommendations.  | 1                                  | Optional content: Safety letters, safety boards web pages                          | ALL |
| ACS<br>LAW 3.1.4<br>10.1.4 HUM           | <del>Appreciate</del> <del>Explain</del> the 'Just Culture' concept.   | 3                                  | Benefits, prerequisites, constraints<br>Optional content: EAM 2 GUI 6, GAIN Report | ALL |
| <b>Subtopic</b>                          | <b>LAW 3.2</b>   | <b>Safety Investigation-Branch</b> |  |     |
| ACS<br>LAW 3.2.1<br>10.2.1 HUM           | Describe role and mission of Safety Investigation <del>Branch</del> in the improvement of safety.              | 2                                  |  | ALL |
| ACS<br>LAW 3.2.2<br>10.2.2 HUM           | Define working methods of Safety Investigation <del>Branch</del> .   | 1                                  |  | ALL |

### Subject 3 : AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

| TOPIC     | ATM 1   | PROVISION OF SERVICES                               | <del>AIR TRAFFIC SERVICES AND AIRSPACE MANAGEMENT</del>  |
|-----------|---|---|--|
| Subtopic  | ATM 1.1   | Air traffic control (ATC) service                   |  |
| ACS       | Appreciate own area of responsibility.  | 3   | APP<br>ACP<br>APS<br>ACS   |
| ATM 1.1.1 |   |   |  |
| 1.1.2     |   |   |  |
| ACS       | Provide <del>the appropriate</del> ATC area control service.  | 4   | ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals<br>ACP<br>ACS   |
| ATM 1.1.2 |   |   |  |
| 1.1.1     |   |   |  |
| Subtopic  | ATM 1.2   | Flight information service (FIS)                    |  |
| ACS       | Provide FIS.  | 4   | ICAO Doc 4444<br>Optional content: national documents<br>ALL   |
| ATM 1.2.1 |   |   |  |
| 1.2.2     |   |   |  |
| ACS       | Use ATS surveillance system for the provision of FIS.   | 3   | ICAO Doc 4444, Information to identified aircraft concerning: traffic, navigation<br>Optional content: weather<br>APS<br>ACS                             |
| ATM 1.2.2 |   |   |  |
| 1.2.3     |   |   |  |
| ACS       | Issue <del>Relay</del> appropriate information concerning the location of <del>other</del> conflicting traffic. | 3   | ICAO Doc 4444, Traffic information, Essential traffic information<br>Optional content: weather<br>APS<br>ACS<br>APP<br>ACP                               |
| ATM 1.2.3 |   |   |  |
| 1.2.1     |   |   |  |
| Subtopic  | ATM 1.3   | Alerting service (ALRS)                             |  |
| ACS       | Provide ALRS.   | 4   | ICAO Doc 4444<br>Optional content: national documents<br>ALL   |
| ATM 1.3.1 |   |   |  |
| ACS       | Respond to distress and urgency messages and signals.   | 3   | ICAO Annex 10, ICAO Doc 4444,<br>Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations<br>ALL |
| ATM 1.3.2 |   |   |  |
| ACS       | Use ATS surveillance system for the provision of ALRS.  | 3   | APS<br>ACS   |
| ATM 1.3.3 |   |   |  |
| Subtopic  | ATM 1.4   | ATS System capacity and air traffic flow management |  |

|   |   |   |  |                          |
|---|---|---|--|--------------------------|
| ACS<br>ATM 1.4.1                                  | Appreciate principles of <del>ATFM</del> ATS system capacity and air traffic flow management. | 3 | Optional content: EUROCONTROL ATFCM Users Manual <del>Working principles of ATFM</del> , FABs, FUA, free flight, etc.  | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 1.4.2                                  | Apply flow management procedures in the provision of ATC.                                     | 3 | Optional content: EUROCONTROL ATFCM Users Manual   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 1.4.3                                  | Organise traffic flows and patterns to take account of airspace boundaries.                   | 4 | Optional content: Civil and Military, Controlled, Uncontrolled, Advisory, Restricted, Danger, Prohibited, Special rules, Sector boundaries, National boundaries, FIR boundaries, Delegated airspace, Transfer of control, Transfer of communications, En-route, Off-route  | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 1.4.4                                  | Organise traffic flows and patterns to take account of areas of responsibility.               | 4 | Optional content: EUROCONTROL ATFCM Users Manual   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 1.4.5                                  | Inform supervisor of situation.   | 3 | Optional content: Abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, , unusual meteorological conditions, relevant information like: reported ground-based incidents, forest fire, smoke, oil pollution | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 1.4.6                                  | Organise traffic flows and patterns to take account of ATS surveillance system capability.    | 4 | Optional content: <del>radar surveillance coverage</del>   | APS<br>ACS               |
| <b>Subtopic ATM 1.5 Airspace management (ASM)</b> |   |   |  |                          |
| ACS<br>ATM 1.5.1                                  | Appreciate the principles and means of ASM.   | 3 | Optional content: FABs, FUA, ICAO Doc 4444, EUROCONTROL ASM HBK - Airspace Management Handbook for the application of FUA, TSAs, CDRs, CBAs  | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 1.5.2                                  | Organise traffic to take account of ASM.  | 4 | <del>real-time activation, deactivation or reallocation of airspace</del><br><br>Optional content: CDR, TSA, TRA, CBA  | APS<br>ACS               |
| <b>TOPIC ATM 2 COMMUNICATION</b>                  |   |   |  |                          |
| <b>Subtopic ATM 2.1 Effective communication</b>   |   |   |  |                          |
| ACS<br>ATM 2.1.1                                  | Use approved phraseology.   | 3 | ICAO Doc 4444<br><br>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2   | ALL                      |
| ACS<br>ATM 2.1.2                                  | Ensure effective <del>Perform</del> communication.<br><del>effectively.</del>                 | 4 | Communication techniques, Readback/verification of readback  | ALL                      |



|           |   |   |  |     |
|-----------|---|---|--|-----|
| ACS       | Analyse examples of pilot and controller communication for effectiveness. | 4 |  | ALL |
| ATM 2.1.3 |   |   |  |     |
| 6.1.2 HUM |   |   |  |     |

## TOPIC ATM 3 ATC CLEARANCES AND ATC INSTRUCTIONS

| Subtopic  | ATM 3.1  | ATC clearances   |                                      |     |
|-----------|--|------------------|--------------------------------------|-----|
| ACS       | Issue appropriate ATC clearances.                          | 3                | ICAO Doc 4444                        | ALL |
| ATM 3.1.1 |  |                  | Optional content: national documents |     |
| ACS       | Integrate appropriate ATC clearances in control service.   | 4                |                                      | ALL |
| ATM 3.1.2 |  |                  |                                      |     |
| ACS       | Ensure the agreed course of action is carried out.         | 4                |                                      | ALL |
| ATM 3.1.3 |  |                  |                                      |     |
| Subtopic  | ATM 3.2  | ATC instructions |                                      |     |
| ACS       | Issue appropriate ATC instructions.                        | 3                | ICAO Doc 4444                        | ALL |
| ATM 3.2.1 |  |                  | Optional content: national documents |     |
| ACS       | Integrate appropriate ATC instructions in control service. | 4                |                                      | ALL |
| ATM 3.2.2 |  |                  |                                      |     |
| ACS       | Ensure the agreed course of action is carried out.         | 4                |                                      | ALL |
| ATM 3.2.3 |  |                  |                                      |     |

## TOPIC ATM 4 COORDINATION

| Subtopic  | ATM 4.1                                   | Necessity for coordination         |   |     |
|-----------|---|------------------------------------|---|-----|
| ACS       | Identify the need for coordination.       | 3                                  |   | ALL |
| ATM 4.1.1 |   |                                    |   |     |
| Subtopic  | ATM 4.2                                   | Tools and methods for coordination |   |     |
| ACS       | Use the available tools for coordination. | 3                                  | Optional content: Electronic transfer of flight data, Telephone, Interphone, Intercom, Direct speech, Radiotelephone (RTF), Local agreements, automated system coordination | ALL |
| ATM 4.2.1 |   |                                    |   |     |
| Subtopic  | ATM 4.3                                   | Coordination procedures            |   |     |
| ACS       | Initiate appropriate coordination.        | 3                                  | Delegation/transfer of responsibility for air-ground communications and separation, transfer of control, etc. ICAO Doc 4444   | ALL |
| ATM 4.3.1 |   |                                    | Optional content: release point   |     |

|                  |  |   |  |     |
|------------------|--|---|--|-----|
| ACS<br>ATM 4.3.2 | Analyse effect of coordination requested by an adjacent position/unit. | 4 | <i>Optional content: Delegation/transfer of responsibility for air-ground communications and separation, release point, transfer of control, etc.</i>  | ALL |
| ACS<br>ATM 4.3.3 | Select, after negotiation, an appropriate course of action.            | 5 | <del>When additional traffic cannot be accepted by adjacent position/unit, When additional traffic cannot be accepted by own position/unit, etc.</del> | ALL |
| ACS<br>ATM 4.3.4 | Ensure the agreed course of action is carried out.                     | 4 |  | ALL |
| ACS<br>ATM 4.3.5 | Coordinate in the provision of FIS.                                    | 4 | ICAO Doc 4444  | ALL |
| ACS<br>ATM 4.3.6 | Coordinate in the provision of ALRS.                                   | 4 | ICAO Doc 4444  | ALL |

## TOPIC ATM 5 ALTIMETRY AND LEVEL ALLOCATION

| Subtopic         | ATM 5.1  | Altimetry         |   |            |  |
|------------------|--|-------------------|---|------------|--|
| ACS<br>ATM 5.1.1 | Allocate levels <del>(height, altitude, flight level)</del> according to altimetry data.                                   | 4                 | ICAO Doc 8168, ICAO Doc 4444  | ALL        |  |
| ACS<br>ATM 5.1.2 | Ensure separation according to altimetry data.   | 4                 | Optional content: Transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries                 | ALL        |  |
| Subtopic         | ATM 5.2  | Terrain clearance |   |            |  |
| ACS<br>ATM 5.2.1 | Provide planning, coordination and control actions appropriate to the rules for minimum safe levels and terrain clearance. | 4                 | Optional content: Minimum vectoring altitude, Terrain clearance dimensions, Minimum safe altitudes, Transition level, Minimum flight level, Minimum sector altitude | APS<br>ACS |  |

## TOPIC ATM 6 SEPARATIONS

| Subtopic         | ATM 6.1                                | Vertical separation |   |   |                          |
|------------------|--|---------------------|---|---|--------------------------|
| ACS<br>ATM 6.1.1 | Provide standard vertical separation.  |                     | 4 | ICAO Doc 4444, ICAO Doc 7030, Level allocation, During climb/descent, Rate of climb/descent, RVSM, non-RVSM aircraft, <a href="#">holding pattern</a> | ACP<br>ACS               |
| ACS<br>ATM 6.1.2 | Provide increased vertical separation. |                     | 4 | ICAO Doc 4444, ICAO Doc 7030<br><i>Optional content: Level allocation, During climb/descent, Rate of climb/descent</i>                                | APP<br>ACP<br>APS<br>ACS |

|  |  |   |  |                          |
|--|--|---|--|--------------------------|
| ACS<br>ATM 6.1.3   | Appreciate the application of vertical emergency separation.   | 3 | ICAO Doc 4444, ICAO Doc 7030   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 6.1.4   | Provide vertical separation in a surveillance environment.   | 4 | Pressure altitude-derived information, pilot level reports<br><br><i>Optional content: Into/out of ATS surveillance system coverage</i>  | APS<br>ACS               |
| <b>Subtopic ATM 6.2 Longitudinal Horizontal separation in a surveillance environment</b> |  |   |  |                          |
| ACS<br>ATM 6.2.1   | Provide longitudinal separation in a surveillance environment.   | 4 | Successive departures, successive arrivals, overflights, speed control, Mach number techniques, silent transfer, ICAO Doc 4444<br><br><i>Optional content: Within ATS surveillance system coverage</i> | ACS                      |
| <b>Subtopic ATM 6.3 Wake turbulence distance-based separation</b>                        |  |   |  |                          |
| ACS<br>ATM 6.3.1   | Provide distance-based wake turbulence separation.   | 4 | ICAO Doc 4444<br><br><i>Optional content: national documents</i>   | APS<br>ACS               |
| <b>Subtopic ATM 6.4 Radar Separation based on ATS surveillance systems</b>               |  |   |  |                          |
| ACS<br>ATM 6.4.1   | Describe how separation based on ATS surveillance systems is applied.  | 2 | ICAO Doc 4444  | APS<br>ACS               |
| ACS<br>ATM 6.4.2   | Provide horizontal separation.   | 4 | ICAO Doc 4444, ICAO Doc 7030<br>Local operation manuals, holding   | APS<br>ACS               |
| ACS<br>ATM 6.4.3   | Provide horizontal separation by using practising vectoring techniques in a variety of situations.                                 | 4 | <i>Optional content: transit, meteorological phenomena, vectoring for approach, departure vs transit vs arrival</i>  | APS<br>ACS               |
| ACS<br>ATM 6.4.4   | Ensure horizontal or vertical separation from airspace boundaries.   | 4 | adjacent sectors, PRD, TSAs  | APS<br>ACS               |
| <b>TOPIC ATM 7 AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS</b>     |  |   |  |                          |
| <b>Subtopic ATM 7.1 Airborne collision avoidance systems</b>                             |  |   |  |                          |
| ACS<br>ATM 7.1.1<br>7.1.6 B  | Differentiate between ACAS advisory thresholds and <del>ATC</del> separation standards applicable in the area control environment. | 2 | ICAO Doc 9863<br><br><i>Optional content: EUROCONTROL TCAS Web page</i>  | ACP<br>ACS               |
| ACS<br>ATM 7.1.2<br>7.1.4 B  | Describe the controller responsibility during and following an ACAS RA reported by pilot.  | 2 | ICAO Doc 4444  | ALL                      |

|  |  |   |   |                          |
|--|--|---|---|--------------------------|
| ACS<br>ATM 7.1.3<br>7.1.1                              | Respond to pilot notification of actions based on airborne systems warnings.     | 3   | ACAS, TAWS<br><i>Optional content: GPWS<br/>EUROCONTROL TCAS Web page</i>   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic</b>  | <b>ATM 7.2</b>   | <b>Ground-based safety nets</b>                 |   |                          |
| ACS<br>ATM 7.2.1                                       | Describe the controller responsibility during and following safety net warnings. | 2   | ICAO Doc 4444<br><i>Optional content: STCA, MSAW, APW, APM</i>  | APS<br>ACS               |
| ACS<br>ATM 7.2.2<br>7.2.1                              | Respond to ground-based safety nets warnings.                                    | 3   | <i>Optional content: STCA, MSAW, APW, APM</i>   | APS<br>ACS               |
| <b>TOPIC ATM 8 DATA DISPLAY</b>                        |  |   |   |                          |
| <b>Subtopic</b>  | <b>ATM 8.1</b>   | <b>Data management</b>                          |   |                          |
| ACS<br>ATM 8.1.1                                       | Update the data display to accurately reflect the traffic situation.             | 3   | <i>Optional content: Information displayed, strip marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs</i> | ALL                      |
| ACS<br>ATM 8.1.2                                       | Analyse pertinent data on data displays.   | 4   |   | ALL                      |
| ACS<br>ATM 8.1.3                                       | Organise pertinent data on data displays.  | 4   |   | ALL                      |
| ACS<br>ATM <del>8.1.4</del>                            | <del>Process pertinent data on data displays.</del>                              | 3   |   | ALL                      |
| ACS<br>ATM 8.1.4<br>8.1.5                              | Obtain flight plan information.  | 3   | CPL, FPL, Supplementary information<br><i>Optional content: RPL, AFIL, etc.</i>   | ALL                      |
| ACS<br>ATM 8.1.5<br>8.1.6                              | Use flight plan information.   | 3   |   | ALL                      |
| <b>TOPIC ATM 9 OPERATIONAL ENVIRONMENT (SIMULATED)</b> |  |   |   |                          |
| <b>Subtopic</b>  | <b>ATM 9.1</b>   | <b>Integrity of the operational environment</b> |   |                          |
| ACS<br>ATM 9.1.1                                       | Obtain information concerning the operational environment.                       | 3   | <i>Optional content: Briefing, notices, local orders, verification of information</i>   | ALL                      |
| ACS<br>ATM 9.1.2                                       | Ensure the integrity of the operational environment.                             | 4   | <i>Optional content: Integrity of displays, Verification of the information provided by displays, etc.</i>  | APP<br>ACP<br>APS<br>ACS |

| <b>Subtopic ATM 9.2 Verification of the currency of operational procedures</b> |  |   |   |                          |
|--|--|---|---|--------------------------|
| ACS<br>ATM 9.2.1   | Check all relevant documentation before managing traffic.                  | 3 | <i>Optional content: Briefing, LOAs, NOTAM, AICs</i>            | ALL                      |
| ACS<br>ATM 9.2.2   | Manage traffic in accordance with procedural changes.                      | 4 |   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 9.3 Handover-takeover</b>                                      |  |   |   |                          |
| ACS<br>ATM 9.3.1   | Transfer information to the relieving controller.                          | 3 |   | ALL                      |
| ACS<br>ATM 9.3.2   | Obtain information from the controller handing over.                       | 3 |   | ALL                      |
| <b>TOPIC ATM 10 PROVISION OF CONTROL SERVICE</b>                               |  |   |   |                          |
| <b>Subtopic ATM 10.1 Responsibility and processing of information</b>          |  |   |   |                          |
| ACS<br>ATM 10.1.1  | Describe the division of responsibility between air traffic control units. | 2 | ICAO Doc 4444   | ALL                      |
| ACS<br>ATM 10.1.2  | Describe the responsibility in regard to military traffic.                 | 2 | ICAO Doc 4444<br><i>Optional content: ICAO Doc 9554</i>         | ALL                      |
| ACS<br>ATM 10.1.3<br>10.1.9  | Describe the responsibility in regard to unmanned free balloons.           | 2 | ICAO Doc 4444   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.1.4<br>10.1.3  | Obtain operational information.  | 3 | ICAO Doc 4444,<br>Local operation manuals                       | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.1.5<br>10.1.4  | Interpret operational information.   | 5 |   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.1.6<br>10.1.5  | Organise forwarding of operational information.                            | 4 | <i>Optional content: including the use of backup procedures</i> | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.1.7<br>10.1.6  | Integrate operational information into control decisions.                  | 4 |   | APP<br>ACP<br>APS<br>ACS |

|   |  |   |   |                          |
|---|--|---|---|--------------------------|
| ACS<br>ATM 10.1.7<br>10.3.6                         | Ensure an adequate priority of actions.  | 4 | Formal and situational requirements, workload   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.1.8<br>3.5.1 ACFT                     | Appreciate the influence of operational requirements.  | 3 | Optional content: Military flying, Calibration flights, Aerial photography                                      | ALL                      |
| ACS<br>ATM 10.1.8<br>10.4.2                         | Balance the workload with the traffic demand.  | 5 | Optional content: in own sector, in adjacent sectors  | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 10.2 ATS surveillance service</b>   |  |   |   |                          |
| ACS<br>ATM 10.2.1                                   | Explain the responsibility for the provision of ATS surveillance service appropriate to ACS rating.  | 2 | ICAO Doc 4444, ICAO Annex 11, Local operation manuals   | ACS                      |
| ACS<br>ATM 10.2.2                                   | Explain the functions that may be performed with the use of ATS surveillance systems derived information presented on a situation display. | 2 | ICAO Doc 4444   | APS<br>ACS               |
| ACS<br>ATM 10.2.3                                   | Provide planning, coordination and control actions appropriate to the VFR and IFR in VMC and IMC.  | 4 | ICAO Annex 2, ICAO Annex 11, ICAO Doc 4444  | ACS                      |
| ACS<br>ATM 10.2.4                                   | Apply the procedures for termination of ATS surveillance service.  | 3 | ICAO Doc 4444<br>Optional content: transfer of control, termination or interruption of ATS surveillance service | APS<br>ACS               |
| <b>Subtopic ATM 10.3 Traffic management process</b> |  |   |   |                          |
| ACS<br>ATM 10.3.1                                   | Ensure that situational awareness is maintained.   | 4 | Information gathering, scanning, traffic projection   | APS<br>ACS               |
| ACS<br>ATM 10.3.2                                   | Detect conflicts in time for appropriate resolution.   | 4 |   | ALL                      |
| ACS<br>ATM 10.3.3                                   | Identify potential solutions to achieve a safe and effective traffic flow.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.3.4                                   | Evaluate possible outcomes of different planning and control actions.  | 5 |   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.3.5                                   | Select an appropriate plan in time to achieve safe and effective traffic flow.   | 5 |   | APP<br>ACP<br>APS<br>ACS |

|   |   |   |   |                          |
|---|---|---|---|--------------------------|
| ACS<br>ATM 10.3.6<br>10.1.7   | Ensure an adequate priority of actions.   | 4 | Formal and situational requirements, workload   | ALL                      |
| ACS<br>ATM 10.3.7   | Execute selected plan in a timely manner.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.3.8   | Ensure a safe and efficient outcome is achieved.  | 4 | Traffic monitoring, adaptability and follow up  | ALL                      |
| <b>Subtopic ATM 10.4 Handling traffic Vectoring</b>                   |   |   |   |                          |
| ACS<br>ATM 10.4.1   | Manage arrivals, departures and overflights.  | 4 |   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.4.2<br>10.1.8   | Balance the workload with the traffic demand against personal capacity.                     | 5 | Optional content: <del>in own sector, in adjacent sectors</del> re-routing, re-planning, prioritising solutions, denying requests, delegating responsibility for separation                       | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 10.4.3<br>10.3.1   | Define flight path monitoring and vectoring.  | 1 | ICAO Doc 4444   | APS<br>ACS               |
| ACS<br>ATM 10.4.4<br>10.3.2   | Explain the requirements for vectoring and termination of vectoring.                        | 2 | ICAO Doc 4444   | APS<br>ACS               |
| ACS<br>ATM 10.4.5<br>10.3.3   | Provide vectoring.  | 4 | ICAO Doc 4444<br><br>Optional content: separation, expediting arrivals, departures and/or climb to cruising levels, aircraft leaving the hold, navigation assistance, uncontrolled airspace, etc. | APS<br>ACS               |
| ACS<br>ATM 10.4.6<br>10.3.4   | Apply the procedures for termination of vectoring.  | 3 | ICAO Doc 4444   | APS<br>ACS               |
| <b>Subtopic ATM 10.5 Control service with advanced system support</b> |   |   |   |                          |
| ACS<br>ATM 10.5.1<br>10.4.1   | Appreciate Explain the impact of advanced systems on the provision of area control service. | 3 | Optional content: sequencing systems, automated holding lists, vertical traffic displays, conflict detection and decision making tools, automated information and coordination tools              | ACS                      |
| <b>TOPIC ATM 11 HOLDING</b>   |   |   |   |                          |
| <b>Subtopic ATM 11.1 General holding procedures</b>                   |   |   |   |                          |

|  |   |   |   |                          |
|--|---|---|---|--------------------------|
| ACS<br>ATM 11.1.1  | Apply holding procedures.   | 3 | ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times         | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM 11.1.2  | Appreciate the factors affecting holding patterns. <del>effect of: wind, aircraft speed, rate of turn, height, aircraft type, aircraft performance.</del> | 3 | effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 11.2 Vertical separation in holding</b>        |   |   |   |                          |
| ACS<br>ATM <del>11.2.1</del><br>6.1.1                          | <del>Provide vertical separation between aircraft in a holding pattern.</del>   | 4 |   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ATM <del>11.2.2</del><br>6.1.1                          | <del>Provide vertical separation between aircraft in a holding pattern and other aircraft.</del>  | 4 |   | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ATM 11.2 Holding aircraft</b>                      |   |   |   |                          |
| ACS<br>ATM 11.2.1<br>11.3.1                                    | Calculate expected onward clearance times.  | 3 |   | ACP<br>ACS               |
| <b>Subtopic ATM 11.3 Holding in a surveillance environment</b> |   |   |   |                          |
| ACS<br>ATM <del>11.4.1</del><br>10.4.3                         | <del>Provide vectors to aircraft leaving a holding pattern.</del>   | 4 |   | APS<br>ACS               |
| ACS<br>ATM 11.3.1<br>11.4.2                                    | Organise traffic to separate other aircraft from holding aircraft.  | 4 |   | APS<br>ACS               |
| ACS<br>ATM <del>11.4.3</del><br>12.3.1                         | <del>Ensure identity of aircraft leaving a holding pattern.</del>   | 4 |   | APS<br>ACS               |
| ACS<br>ATM 11.3.2<br>11.4.4                                    | Integrate system support, when available.   | 4 | Optional content: arrival management system, automated holding lists, vertical traffic displays   | APS<br>ACS               |

## TOPIC ATM 12 IDENTIFICATION

### Subtopic ATM 12.1 Establishment of identification



|  |  |   |  |            |
|--|--|---|--|------------|
| ACS<br>ATM 12.1.1<br>12.1.3                            | Appreciate the precautions when establishing identification.                             | 3 |  | APS<br>ACS |
| ACS<br>ATM 12.1.1<br>9.4.1 ATMB                        | <del>Explain the methods and procedures of establishing identification.</del>            | 2 | <del>ICAO Doc 4444</del><br><del>Optional content: PSR</del>   | APS<br>ACS |
| ACS<br>ATM 12.1.2                                      | Identify aircraft.   | 3 | Optional content: PSR, SSR or ADS identification method  | APS<br>ACS |
| ACS<br>ATM 12.1.2<br>12.1.2<br>9.4.2 ATMB              | <del>Apply the procedures of establishing identification.</del>                          | 3 | Any of the ATS Surveillance systems identification methods   | APS<br>ACS |
| ACS<br>ATM 12.1.3<br>12.1.4                            | Apply procedures in the case of misidentification.                                       | 3 |  | APS<br>ACS |
| <b>Subtopic ATM 12.2 Maintenance of identification</b> |  |   |  |            |
| ACS<br>ATM 12.2.1                                      | Appreciate the necessity to maintain identification.                                     | 3 |  | APS<br>ACS |
| <b>Subtopic ATM 12.3 Loss of identity</b>              |  |   |  |            |
| ACS<br>ATM 12.3.1                                      | Appreciate when an aircraft identification is lost or in doubt.                          | 3 | Optional content: Out of ATS surveillance system coverage, failure of ATS surveillance system, weather clutter, other clutter, garbling, holding, etc. | APS<br>ACS |
| ACS<br>ATM 12.3.2                                      | Apply methods to re-establish identification.  | 3 |  | APS<br>ACS |
| ACS<br>ATM 12.3.3                                      | Respond to loss/doubt concerning identification.   | 3 | Optional content: procedural separation  | APS<br>ACS |
| <b>Subtopic ATM 12.4 Position information</b>          |  |   |  |            |
| ACS<br>ATM 12.4.1                                      | Appreciate the circumstances when position information should be passed to the aircraft. | 3 |  | APS<br>ACS |
| ACS<br>ATM 12.4.2                                      | State the format in which position information can be passed to aircraft.                | 1 | ICAO Doc 4444  | APS<br>ACS |
| <b>Subtopic ATM 12.5 Transfer of identity</b>          |  |   |  |            |

|                   |  |   |            |
|-------------------|--|---|------------|
| ACS<br>ATM 12.5.1 | Apply the methods of transfer of identification.             | 3 | APS<br>ACS |
| ACS<br>ATM 12.5.2 | Appreciate the precautions when transferring identification. | 3 | APS<br>ACS |

## Subject 4 : METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

### TOPIC MET 1 METEOROLOGICAL PHENOMENA

| Subtopic                             | MET 1.1   | Meteorological phenomena |   |                          |
|--------------------------------------|---|--------------------------|---|--------------------------|
| ACS<br>MET 1.1.1                     | Appreciate the impact of adverse weather.   | 3                        | Thunderstorms, Icing, Jet streams, Clear Air Turbulence (CAT), Turbulence, Microburst, Severe mountain waves, Line squalls, <b>Volcanic ash</b><br><br><i>Optional content: <del>Volcanic ash</del> Solar radiation</i> | ACP<br>ACS               |
| ACS<br>MET 1.1.2                     | Integrate data about meteorological phenomena into provision of ATS.  | 4                        | <b>clearances, instructions and transmitted information</b><br><br><i>Optional content: <b>relevant meteorological phenomena</b><br/><del>Separation, holding, diversions, re-routings, etc.</del></i>                  | ALL                      |
| ACS<br>MET <del>1.1.3</del><br>1.1.2 | <del>Integrate data about meteorological phenomena into clearances, instructions and transmitted information.</del> | 4                        | <del><i>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</i></del>   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>MET 1.1.3<br>1.1.4            | Use techniques to avoid adverse weather when necessary/possible.  | 3                        | <b>Rerouting, level change, etc.</b>  | APP<br>ACP<br>APS<br>ACS |

### TOPIC MET 2 SOURCES OF METEOROLOGICAL DATA

| Subtopic         | MET 2.1                           | Sources of meteorological information |   |                          |
|------------------|-----------------------------------|---------------------------------------|---|--------------------------|
| ACS<br>MET 2.1.1 | Obtain meteorological information | 3                                     | <b>METAR, TAF, SIGMET, AIRMET</b><br><br><i>Optional content: AIREP/AIREP Special</i>   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>MET 2.1.2 | Relay meteorological information. | 3                                     | <b>ICAO Doc 4444 <del>To: aircraft, MET office</del></b><br><br><i>Optional content: flight information centre, adjacent ATS unit</i> | APP<br>ACP<br>APS<br>ACS |

## Subject 5 : NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

### TOPIC NAV 1 MAPS AND AERONAUTICAL CHARTS

| Subtopic  | NAV 1.1 | Maps and charts               |   |                          |
|-----------|---------|-------------------------------|---|--------------------------|
| ACS       |         | Use relevant maps and charts. | 3 |                          |
| NAV 1.1.1 |         |                               |   | APP<br>ACP<br>APS<br>ACS |

### TOPIC NAV 2 INSTRUMENTAL NAVIGATION

| Subtopic  | NAV 2.1 | Navigational systems  |   |  |
|-----------|---------|---|---|--|
| ACS       |         | Manage traffic in case of change in the operational status of navigational systems.                           | 4 | Optional content: limitations, status of ground-based and satellite-based systems  |
| NAV 2.1.1 |         |   |   | APP<br>ACP<br>APS<br>ACS   |
| ACS       |         | Appreciate the effect of precision, limitations and change of the operational status of navigational systems. | 3 | Optional content: limitations, status, degraded procedures   |
| NAV 2.1.2 |         |   |   | ALL  |
| Subtopic  | NAV 2.2 | Navigational assistance   |   |  |
| ACS       |         | Evaluate the necessary information to be provided to pilots in need of navigational assistance.               | 5 | Optional content: Nearest most suitable aerodrome, Track, Heading, Distance, Aerodrome information, Any other navigational assistance relevant at the time |
| NAV 2.2.1 |         |   |   | APP<br>ACP<br>APS<br>ACS   |
| ACS       |         | Assist aircraft in navigation when required.  | 3 | Aircraft observed to be deviating from its known intended route, on request  |
| NAV 2.2.2 |         |   |   | APS<br>ACS   |
| Subtopic  | NAV 2.3 | PBN applications  |   |  |
| ACS       |         | State the navigation applications used in terminal and en-route environments.                                 | 1 | Terminal-RNAV-1 (≈P-RNAV); En-route-RNAV-5 (B-RNAV)  |
| NAV 2.3.1 |         |   |   | Optional content: A-RNP, EC PBN Implementing Rule, ICAO Doc 9613   |
| ACS       |         | Explain the principles and designation of navigation specifications in use.                                   | 2 | Optional content: performance, functionality, sensors, aircrew and controller requirements   |
| NAV 2.3.2 |         |   |   | APP<br>ACP<br>APS<br>ACS   |
| ACS       |         | State future PBN developments.  | 1 | A-RNP, APV   |
| NAV 2.3.3 |         |   |   | Optional content: RNP 3D, RNP 4D   |
|           |         |   |   | ADI<br>APP<br>ACP<br>APS<br>ACS  |

**Subject 6 : AIRCRAFT**

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

**TOPIC ACFT 1 AIRCRAFT INSTRUMENTS**

| Subtopic                     | ACFT 1.1  | Aircraft instruments |   |                   |
|------------------------------|---|----------------------|---|-------------------|
| ACS<br>ACFT 1.1.1            | Integrate <del>the information</del> <del>indication</del> from aircraft instruments provided by the pilot in the provision of ATS. | 4                    | <del>Optional content: TCAS, wind shear indicator, weather radar</del>    | ALL               |
| ACS<br>ACFT 1.1.2            | Explain the operation of aircraft radio equipment.  | 2                    | Optional content: Radios (number of), emergency radios, <del>SELCAL</del> | ALL               |
| ACS<br>ACFT 1.1.3            | Explain the operation of on-board surveillance equipment.   | 2                    | Transponders: equipment Mode A, Mode C, Mode S, ADS capability            | ADI<br>APS<br>ACS |
| ACS<br>ACFT <del>1.1.4</del> | <del>Explain the use and benefits of CPDLC.</del>   | 2                    |   | ALL               |

**TOPIC ACFT 2 AIRCRAFT CATEGORIES**

| Subtopic          | ACFT 2.1  | Wake turbulence <del>categories</del> |  |     |
|-------------------|---|---------------------------------------|--|-----|
| ACS<br>ACFT 2.1.1 | Explain the wake turbulence effect and associated hazards to the succeeding aircraft.                     | 2                                     |  | ALL |
| ACS<br>ACFT 2.1.2 | Appreciate the techniques used to prevent hazards associated with wake turbulence on succeeding aircraft. | 3                                     |  | ALL |

**TOPIC ACFT 3 FACTORS AFFECTING AIRCRAFT PERFORMANCE**

| Subtopic          | ACFT 3.1  | Climb factors   |  |                          |
|-------------------|---|-----------------|--|--------------------------|
| ACS<br>ACFT 3.1.1 | Integrate the influence of factors affecting aircraft during climb.   | 4               | Optional content: speed, mass, air density, <del>cabin pressurisation</del> , wind and temperature | APP<br>ACP<br>APS<br>ACS |
| Subtopic          | ACFT 3.2  | Cruise factors  |  |                          |
| ACS<br>ACFT 3.2.1 | Integrate the influence of factors affecting aircraft during cruise.  | 4               | Level, cruising speed, wind, mass, cabin pressurisation  | APP<br>ACP<br>APS<br>ACS |
| Subtopic          | ACFT 3.3  | Descent factors |  |                          |
| ACS<br>ACFT 3.3.1 | Integrate the influence of factors affecting aircraft during descent. | 4               | Optional content: wind, speed, rate of descent, cabin pressurisation                               | ACP<br>ACS               |

| Subtopic ACFT 3.4 Economic factors                 |   |   |   |                          |
|--|---|---|---|--------------------------|
| ACS<br>ACFT 3.4.1                                  | Integrate consideration of economic factors affecting aircraft.   | 4 | <i>Optional content: Routing, Level, Speed, Rate of climb and Rate of descent, Approach profile, Top of descent</i> | ACP<br>ACS               |
| ACS<br>ACFT 3.4.2                                  | Use continuous climb techniques where applicable.   | 3 |   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ACFT 3.4.3                                  | Use direct routing where applicable.  | 3 |   | APP<br>ACP<br>APS<br>ACS |
| Subtopic ACFT 3.5 <del>Miscellaneous factors</del> |   |   |   |                          |
| ACS<br>ACFT 3.5.1<br>10.1.8 ATM                    | <del>Appreciate the influence of operational requirements.</del>  | 3 | <del>Optional content: Military flying, Calibration flights, Aerial photography, banner towing</del>                | ACP<br>ACS               |
| Subtopic ACFT 3.5 Environmental factors            |   |   |   |                          |
| ACS<br>ACFT 3.5.1                                  | Appreciate the performance restrictions due to environmental constraints.   | 3 | <i>Optional content: Fuel dumping, Minimum flight levels, Continuous Descent Operations</i>                         | ACP<br>ACS               |
| TOPIC ACFT 4 AIRCRAFT DATA                         |   |   |   |                          |
| Subtopic ACFT 4.1 Performance data                 |   |   |   |                          |
| ACS<br>ACFT 4.1.1                                  | Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/working environment into the provision of a control service. | 4 | Performance data under a representative variety of circumstances  | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ACFT 4.1.2<br>1.1.2 ABES                    | <del>Identify potential or actual emergency situations.</del>   | 3 |   | APP<br>ACP<br>APS<br>ACS |

## Subject 7 : HUMAN FACTORS

The subject objective is:

Learners shall recognise the necessity to constantly extend their knowledge and analyse factors which affect personal and team performance.

### TOPIC HUM 1 PSYCHOLOGICAL FACTORS

| Subtopic         | HUM 1.1  | Cognitive |   |     |
|------------------|--|-----------|---|-----|
| ACS<br>HUM 1.1.1 | Describe the human information processing model.                               | 2         | Attention, perception, memory, situational awareness, decision making, response                                   | ALL |
| ACS<br>HUM 1.1.2 | Describe the factors which influence human information processing.             | 2         | Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations | ALL |
| ACS<br>HUM 1.1.3 | Monitor the effect of human information processing factors on decision making. | 3         | <i>Optional content: workload, stress, interpersonal relations, distraction, confidence</i>                       | ALL |

### TOPIC HUM 2 MEDICAL AND PHYSIOLOGICAL FACTORS

| Subtopic         | HUM 2.1   | Fatigue |  |     |
|------------------|---|---------|--|-----|
| ACS<br>HUM 2.1.1 | State factors that cause fatigue.   | 1       | Shift work<br><br><i>Optional content: night shifts and rosters</i>  | ALL |
| ACS<br>HUM 2.1.2 | Describe the onset of fatigue.  | 2       | <i>Optional content: Lack of concentration, Listlessness, Irritability, Frustration, ICAO Circular 241 – AN/145 Human factors in Air Traffic Control</i> | ALL |
| ACS<br>HUM 2.1.3 | Recognise the onset of fatigue in self.                                   | 1       | <i>Optional content: ICAO Circular 241 – AN/145 Human factors in Air Traffic Control</i>   | ALL |
| ACS<br>HUM 2.1.4 | Recognise the onset of fatigue in others.                                 | 1       |  | ALL |
| ACS<br>HUM 2.1.5 | Describe <del>Consider</del> appropriate action when recognising fatigue. | 2       |  | ALL |
| Subtopic         | HUM 2.2   | Fitness |  |     |
| ACS<br>HUM 2.2.1 | Recognise signs of lack of personal fitness.                              | 1       |  | ALL |

|  |   |                                       |  |     |
|--|---|---------------------------------------|--|-----|
| ACS<br>HUM 2.2.2                                     | Describe actions when aware of a lack of personal fitness.  | 2                                     |  | ALL |
| <b>TOPIC HUM 3 SOCIAL AND ORGANISATIONAL FACTORS</b> |   |                                       |  |     |
| <b>Subtopic</b>                                      | <b>HUM 3.1</b>  | <b>Team resource management (TRM)</b> |  |     |
| ACS<br>HUM 3.1.1                                     | State the <b>relevance objectives</b> of TRM.   | 1                                     | <i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>                                      | ALL |
| ACS<br>HUM 3.1.2                                     | State the content of the TRM concept.   | 1                                     | <i>Optional content: team work, human error, team roles, stress, decision making, communication, situational awareness</i>           | ALL |
| <b>Subtopic</b>                                      | <b>HUM 3.2</b>  | <b>Teamwork and team roles</b>        |  |     |
| ACS<br>HUM 3.2.1                                     | Identify reasons for conflict.  | 3                                     |  | ALL |
| ACS<br>HUM 3.2.2                                     | Describe actions to prevent human conflicts.  | 2                                     | <i>Optional content: TRM team roles</i>  | ALL |
| ACS<br>HUM 3.2.3                                     | Describe strategies to cope with human conflicts.   | 2                                     | <i>Optional content: in your team, in the simulator</i>  | ALL |
| <b>Subtopic</b>                                      | <b>HUM 3.3</b>  | <b>Responsible behaviour</b>          |  |     |
| ACS<br>HUM 3.3.1                                     | Consider the factors which influence responsible behaviour.   | 2                                     | <i>Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality</i> | ALL |
| ACS<br>HUM 3.3.2                                     | Apply responsible judgement.  | 3                                     | Case study and discussion about a dilemma situation  | ALL |
| <b>TOPIC HUM 4 STRESS</b>                            |   |                                       |  |     |
| <b>Subtopic</b>                                      | <b>HUM 4.1</b>  | <b>Stress</b>                         |  |     |
| ACS<br>HUM 4.1.1                                     | Recognise the effects of stress on performance.   | 1                                     | Stress and its symptoms in self and in others  | ALL |
| <b>Subtopic</b>                                      | <b>HUM 4.2</b>  | <b>Stress management</b>              |  |     |
| ACS<br>HUM 4.2.1                                     | Act to reduce stress.   | 3                                     | The effect of personality in coping with stress, The benefits of active stress management  | ALL |
| ACS<br>HUM 4.2.2                                     | Respond to stressful situation by offering, asking or accepting assistance. <b>Obtain assistance in stressful situations.</b> | 3                                     | <i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i>                             | ALL |



|                  |  |   |  |     |
|------------------|--|---|--|-----|
| ACS<br>HUM 4.2.3 | Recognise the effect of shocking and stressful events.               | 1 | Self and others, Abnormal situations, CISM         | ALL |
| ACS<br>HUM 4.2.4 | Consider the benefits of Critical Incident Stress Management (CISM). | 2 |  | ALL |
| ACS<br>HUM 4.2.5 | Explain procedures used following an incident/accident.              | 2 | Optional content: CISM, Counselling, Human element | ALL |

## TOPIC HUM 5 HUMAN ERROR

| Subtopic         | HUM 5.1  | Human error |  |     |
|------------------|--|-------------|--|-----|
| ACS<br>HUM 5.1.1 | Explain the relationship between error and safety.                               | 2           | Number and combination of errors, proactive versus reactive approach to discovery of error<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i> | ALL |
| ACS<br>HUM 5.1.2 | Differentiate between the types of error.  | 2           | Slips, Lapses, Mistakes<br><br><i>Optional content: <del>Slips, Lapses, Mistakes</del> ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>                                 | ALL |
| ACS<br>HUM 5.1.3 | Describe error-prone conditions.   | 2           | <i>Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences</i>  | ALL |
| ACS<br>HUM 5.1.4 | Collect examples of different error types, their causes and consequences in ATC. | 3           | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ACS<br>HUM 5.1.5 | Explain how to detect errors to compensate for them.                             | 2           | STCA, MSAW, individual and collective strategy<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ACS<br>HUM 5.1.6 | Execute corrective actions.  | 3           | Error compensation<br><br><i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>   | ALL |
| ACS<br>HUM 5.1.7 | Explain the importance of error management.                                      | 2           | <i>Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practises</i>  | ALL |

|  |  |   |  |     |
|--|--|---|--|-----|
| ACS<br>HUM 5.1.8   | Describe the impact on an ATCO following an occurrence/incident.   | 2 | <i>Optional content: reporting, SMS, investigation, CISM</i>   | ALL |
| <b>Subtopic HUM 5.2 Violation of rules</b>   |  |   |  |     |
| ACS<br>HUM 5.2.1   | Explain the causes and dangers of violation of rules becoming accepted as a practice.  | 2 | <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>     | ALL |
| <b>TOPIC HUM 6 WORKING METHODS</b>   |  |   |  |     |
| <b>Subtopic HUM 6.1 Efficiency</b>   |  |   |  |     |
| ACS<br>HUM 6.1.1   | <del>Consider, from a human factors point of view, the factors affecting efficiency in the provision of air traffic control.</del> | 2 | <del><i>Optional content: Own and others workload, OT, customer requirements, economy, ecology, safety</i></del> | ALL |
| <b>TOPIC HUM 6 COLLABORATIVE WORK</b>  |  |   |  |     |
| <b>Subtopic HUM 6.1 Communication</b>  |  |   |  |     |
| ACS<br>HUM 6.1.1<br>8.1.1  | Use communication effectively in ATC.  | 3 |  | ALL |
| ACS<br>HUM 6.1.2<br>2.1.3 ATM  | Analyse examples of pilot and controller communication for effectiveness.  | 4 |  | ALL |
| <b>Subtopic HUM 6.2 Collaborative work within the same area of responsibility</b>    |  |   |  |     |
| ACS<br>HUM 6.2.1<br>8.2.1  | List communication means between controllers in charge of the same area of responsibility (sector or tower).                       | 1 | <i>Optional content: Electronic, written, verbal and non-verbal communication</i>                                | ALL |
| ACS<br>HUM 6.2.2<br>8.2.2  | Explain consequences of the use of communication means on effectiveness.   | 2 | <i>Optional content: Strips legibility and encoding, labels designation, Feedback</i>                            | ALL |
| ACS<br>HUM 6.2.3<br>8.2.3  | List possible actions to provide a safe position handover.   | 1 | <i>Optional content: rigour, preparation, overlap time</i>   | ALL |
| ACS<br>HUM 6.2.4<br>8.2.4  | Explain consequences of a missed position handover process.  | 2 |  | ALL |
| <b>Subtopic HUM 6.3 Collaborative work between different areas of responsibility</b> |  |   |  |     |

|  |  |   |  |     |
|--|--|---|--|-----|
| ACS<br>HUM 6.3.1<br>8.3.1                              | List factors and means for an effective coordination between sectors and/or tower positions.                   | 1 | <i>Optional content: Other sectors constraints, electronic coordination tools</i>                        | ALL |
| <b>Subtopic HUM 6.4 Controller / pilot cooperation</b> |  |   |  |     |
| ACS<br>HUM 6.4.1<br>8.4.1                              | Describe parameters affecting controller/pilot cooperation.  | 2 | <i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>                  | ALL |
| <b>TOPIC HUM 7 WORKING KNOWLEDGE</b>                   |  |   |  |     |
| <b>Subtopic HUM 7.1 Controller knowledge</b>           |  |   |  |     |
| ACS<br>HUM 7.1.1<br>1.1.2 LAW                          | Explain how to maintain and update professional knowledge to retain competence in the operational environment. | 2 | <i>Optional content: Briefing, LOAs, NOTAM, AICs, Reports of accident/incident, VOLMET, ATIS, SIGMET</i> | ALL |
| <b>TOPIC HUM 9 WORK ENVIRONMENT</b>                    |  |   |  |     |
| <b>Subtopic HUM 9.1 Ergonomics</b>                     |  |   |  |     |
| ACS<br>HUM 9.1.1                                       | <del>Appreciate the impact of working position ergonomics on controller activity.</del>                        | 3 |  | ALL |
| <b>TOPIC HUM 10 ATC SAFETY MANAGEMENT</b>              |  |   |  |     |
| <b>Subtopic HUM 10.1 Experience feedback</b>           |  |   |  |     |
| ACS<br>HUM 10.1.1<br>3.1.1 LAW                         | State the importance of the controllers contribution to the experience feedback process.                       | 1 | <i>Optional content: voluntary reporting</i>   | ALL |
| ACS<br>HUM 10.1.2<br>3.1.2 LAW                         | Describe how reported occurrences are analysed.  | 2 | <i>Optional content: ESARR2, local procedures</i>  | ALL |
| ACS<br>HUM 10.1.3<br>3.1.3 LAW                         | Name the means used to disseminate recommendations.  | 1 | <i>Optional content: Safety letters, safety boards web pages</i>   | ALL |
| ACS<br>HUM 10.1.4<br>3.1.4 LAW                         | Explain the "Just Culture" concept.  | 2 | <i>benefits, prerequisites, constraints</i><br><i>Optional content: EAM 2 GUI 6, GAIN Report</i>         | ALL |
| <b>Subtopic HUM 10.2 Safety investigation branch</b>   |  |   |  |     |
| ACS<br>HUM 10.2.1<br>3.2.1 LAW                         | Describe role and mission of Safety Investigation Branch in the improvement of safety.                         | 2 |  | ALL |

---

|            |   |   |     |
|------------|---|---|-----|
| ACS        | <del>Define working methods of Safety</del> | 1 | ALL |
| HUM 10.2.2 | <del>Investigation Branch:</del>            |   |     |
| 3.2.2 LAW  |   |   |     |

---

## Subject 8 : EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall integrate knowledge and understanding of the basic working principles of equipment and systems and comply with the equipment and system degradation procedures in the provision of ATS.

### TOPIC EQPS 1 VOICE COMMUNICATIONS

| Subtopic          | EQPS 1.1   | Radio communications       |  |                          |
|-------------------|--|----------------------------|--|--------------------------|
| ACS<br>EQPS 1.1.1 | Operate two-way communication equipment.                       | 3                          | Transmit/receive switches, Procedures<br><i>Optional content: Frequency selection, Standby equipment</i>                                       | ALL                      |
| ACS<br>EQPS 1.1.2 | Identify indications of operational status of radio equipment. | 3                          | <i>Optional content: Indicator lights, Serviceability displays, Selector/frequency displays</i>  | ALL                      |
| ACS<br>EQPS 1.1.3 | Consider radio range.  | 2                          | <i>Optional content: Transfer to another frequency, Apparent radio failure, Failure to establish radio contact, Frequency protection range</i> | APP<br>ACP<br>APS<br>ACS |
| Subtopic          | EQPS 1.2   | Other voice communications |  |                          |
| ACS<br>EQPS 1.2.1 | Operate landline communications.                               | 3                          | <i>Optional content: telephone, interphone and intercom equipment</i>  | ALL                      |

### TOPIC EQPS 2 AUTOMATION IN ATS

| Subtopic          | EQPS 2.1   | Aeronautical fixed telecommunication network (AFTN) |   |                          |
|-------------------|--|---|---|--------------------------|
| ACS<br>EQPS 2.1.1 | Decode AFTN messages.                                  | 3   | <i>Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.</i>     | ALL                      |
| Subtopic          | EQPS 2.2   | Automatic data Interchange                          |   |                          |
| ACS<br>EQPS 2.2.1 | Use automatic data transfer equipment where available. | 3   | <i>Optional content: Sequencing systems, Automated information and coordination, OLDI</i> | ADV<br>ADI<br>APS<br>ACS |

### TOPIC EQPS 3 CONTROLLER WORKING POSITION

| Subtopic          | EQPS 3.1  | Operation and monitoring of equipment |   |     |
|-------------------|---|---------------------------------------|---|-----|
| ACS<br>EQPS 3.1.1 | Monitor the technical integrity of the controller working position. | 3                                     | Notification procedures, Responsibilities   | ALL |
| ACS<br>EQPS 3.1.2 | Operate the equipment of the controller working position.           | 3                                     | <i>Optional content: Situation displays, Flight progress board, Flight data display, Radio, Telephone, Maps and charts, Strip-printer, Clock, Information systems monitors, (CCIS), UDF/VDF</i> | ALL |

|   |  |   |   |
|---|--|---|---|
| ACS<br>EQPS 3.1.3   | Operate <del>all</del> available equipment in <del>unusual/degraded/abnormal</del> and emergency situations. | 3 | ALL   |
| <b>Subtopic EQPS 3.2 Situation displays and information systems</b> |  |   |   |
| ACS<br>EQPS 3.2.1   | Use situation displays.  | 3 | ALL   |
| ACS<br>EQPS 3.2.2   | Check availability of information material.  | 3 | ALL   |
| ACS<br>EQPS 3.2.3   | Obtain information from equipment.   | 3 | APP<br>ACP<br>APS<br>ACS  |
| <b>Subtopic EQPS 3.3 Flight data systems</b>                        |  |   |   |
| ACS<br>EQPS 3.3.1   | Use the flight data information at controller working position.  | 3 | ALL   |
| <b>Subtopic EQPS 3.4 Use of ATS surveillance system</b>             |  |   |   |
| ACS<br>EQPS 3.4.1   | Use the ATS surveillance system functions.   | 3 | APS<br>ACS  |
| ACS<br>EQPS 3.4.2   | Analyse the information provided by the ATS surveillance system.   | 4 | APS<br>ACS  |
| ACS<br>EQPS 3.4.3   | Assign codes.  | 4 | APS<br>ACS  |
| ACS<br>EQPS 3.4.4   | Appreciate the use of advanced surveillance technology.  | 3 | <i>Optional content: Mode S, ADS-B, MLAT</i><br>APS<br>ACS                            |
| <b>Subtopic EQPS 3.5 Advanced systems</b>                           |  |   |   |
| ACS<br>EQPS 3.5.1   | Appreciate the use of controller pilot datalink communications when available.                               | 3 | APS<br>ACS  |
| ACS<br>EQPS 3.5.2   | Appreciate the use of information provided by advanced systems.  | 3 | <i>Optional content: trajectory-based information, MTCD, MONA, etc.</i><br>APS<br>ACS |
| <b>TOPIC EQPS 4 FUTURE EQUIPMENT</b>                                |  |   |   |
| <b>Subtopic EQPS 4.1 New developments</b>                           |  |   |   |
| ACS<br>EQPS 4.1.1   | Recognise future developments.   | 1 | New advanced systems<br>ALL   |

**TOPIC EQPS 5 EQUIPMENT AND SYSTEMS LIMITATIONS AND DEGRADATION**

| <b>Subtopic EQPS 5.1 Reaction to limitations</b>             |  |   |  |  |                                 |
|--|--|---|--|--|---------------------------------|
| ACS<br>EQPS 5.1.1  | Take account of the limitations of equipment and systems.                              | 2 |  |  | ALL                             |
| ACS<br>EQPS 5.1.2  | Respond to technical deficiencies of the operational position.                         | 3 | Notification procedures, Responsibilities  |  | ALL                             |
| <b>Subtopic EQPS 5.2 Communication equipment degradation</b> |  |   |  |  |                                 |
| ACS<br>EQPS 5.2.1  | Identify that communication equipment has degraded.                                    | 3 | Optional content: Ground-air and landline communications   |  | APP<br>ACP<br>APS<br>ACS        |
| ACS<br>EQPS 5.2.2  | Integrate contingency procedures in the event of communication equipment degradation.  | 3 | Procedures for total or partial degradation of ground-air and landline communications, Alternative methods of transferring data  |  | APP<br>ACP<br>APS<br>ACS        |
| <b>Subtopic EQPS 5.3 Navigational equipment degradation</b>  |  |   |  |  |                                 |
| ACS<br>EQPS 5.3.1  | Identify when a navigational equipment failure will affect operational ability.        | 3 | Optional content: VOR, Navigational aids   |  | ALL                             |
| ACS<br>EQPS 5.3.2  | Integrate contingency procedures in the event of a navigational equipment degradation. | 3 | Optional content: Vertical separation, Information to aircraft, Navigational assistance, Seeking assistance from adjacent units  |  | ADI<br>APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic EQPS 5.4 Surveillance equipment degradation</b>  |  |   |  |  |                                 |
| ACS<br>EQPS 5.4.1  | Identify that surveillance equipment has degraded.                                     | 3 | Partial power failure, Loss of certain facilities, Total failure   |  | APS<br>ACS                      |
| ACS<br>EQPS 5.4.2  | Apply contingency procedures in the event of surveillance equipment degradation.       | 3 | Optional content: Inform adjacent sectors, Inform aircraft, Apply vertical separation (emergency), Increased horizontal separation, Reduce the number of aircraft entering area of responsibility, Transfer aircraft to another unit |  | APS<br>ACS                      |
| <b>Subtopic EQPS 5.5 ATC processing system degradation</b>   |  |   |  |  |                                 |
| ACS<br>EQPS 5.5.1  | Identify a processing system degradation.  | 3 | Optional content: FDPS, SDPS, Software processing of situation display   |  | APS<br>ACS                      |
| ACS<br>EQPS 5.5.2  | Apply contingency procedures in the event of a processing system degradation.          | 3 |  |  | APS<br>ACS                      |

## Subject 9 : PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

### TOPIC PEN 1 FAMILIARISATION PROFESSIONAL ENVIRONMENT

#### Subtopic PEN 1.1 Study visit to area control centre

|           |   |   |                                    |     |
|-----------|---|---|------------------------------------|-----|
| ACS       | Appreciate the functions and provision of | 3 | study visit to area control centre | ACP |
| PEN 1.1.1 | an operational area control service.      |   |                                    | ACS |

### TOPIC PEN 2 AIRSPACE USERS

#### Subtopic PEN 2.1 Contributors to civil ATS operations

|           |  |   |  |     |
|-----------|--|---|--|-----|
| ACS       | Characterise civil <del>and military</del> ATS | 2 | Study visit to an area control centre  | ACP |
| PEN 2.1.1 | activities in area control centre.             |   |  | ACS |
| 1.1.1     |  |   | Optional content: Familiarisation visits to <del>e.g. TWR, APP, ACC, AIS, RCC, Air Defence Units</del> |     |

|           |   |   |   |     |
|-----------|---|---|---|-----|
| ACS       | Characterise other parties interfacing with | 2 | Optional content: familiarisation visits to engineering services, fire and emergency services, airline operations offices | ALL |
| PEN 2.1.2 | ATS operations.                             |   |   |     |
| 1.1.2     |   |   |   |     |

#### Subtopic PEN 2.2 Contributors to military ATS operations

|           |  |   |  |     |
|-----------|--|---|--|-----|
| ACS       | Characterise <del>civil and</del> military ATS | 2 | Optional content: Familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units | ALL |
| PEN 2.2.1 | activities.                                    |   |  |     |
| 1.1.1     |  |   |  |     |

### TOPIC PEN 3 CUSTOMER RELATIONS

#### Subtopic PEN 3.1 ~~Customer relations~~ Provision of services and user requirements

|           |   |   |  |     |
|-----------|---|---|--|-----|
| ACS       | Identify the role of ATC as a service                       | 3 | <del>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</del> | ALL |
| PEN 3.1.1 | provider. <del>and the requirements of the ATS users.</del> |   |  |     |
| 1.2.1     |   |   |  |     |

|           |                                    |   |  |     |
|-----------|------------------------------------|---|--|-----|
| ACS       | Appreciate ATS users requirements. | 3 | <del>Optional content: familiarisation flights, flight simulator visits, liaison visits to aerodrome authority, aircraft and/or airfield operators</del> | ALL |
| PEN 3.1.2 |                                    |   |  |     |
| 1.2.1     |                                    |   |  |     |

### TOPIC PEN 4 ENVIRONMENTAL PROTECTION

#### Subtopic PEN 4.1 Environmental protection



---

|           |   |   |   |     |
|-----------|---|---|---|-----|
| ACS       | Appreciate the mitigation techniques used           | 3 | Optional content: <i>FRA, night/weekend</i>     | ACP |
| PEN 4.1.1 | en-route to minimise the aviation's impact          |   | <i>routes curfews, relations with local</i>     | ACS |
| 1.3.1     | on the environment. <del>Describe processes</del>   |   | <del>community, relations with</del>            |     |
|           | <del>used to ensure environmental protection.</del> |   | <del>environmental associations, relevant</del> |     |
|           |   |   | <del>administrations</del>                      |     |
|           |   |   | <i>ICAO Circular 303 - Operational</i>          |     |
|           |   |   | <i>opportunities to minimize fuel use and</i>   |     |
|           |   |   | <i>reduce emissions</i>                         |     |

---

## Subject 10: ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in unusual, degraded and emergency situations.

### TOPIC ABES 1 ~~UNUSUAL/DEGRADED~~/ABNORMAL AND EMERGENCY SITUATIONS (ABES)

| Subtopic                        | ABES 1.1  | Overview of <del>UNUSUAL/DEGRADED</del> ABES |   |                          |
|---------------------------------|---|--|---|--------------------------|
| ACS<br>ABES 1.1.1               | List common <del>unusual/degraded</del> /abnormal and emergency situations.   | 1  | Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, <del>GPWS</del> ground based safety nets alerts, airframe failure, unreliable instruments, runway incursion | ALL                      |
| ACS<br>ABES 1.1.2<br>4.1.2 ACFT | Identify potential or actual abnormal and emergency situations.   | 3  |   | ALL                      |
| ACS<br>ABES 1.1.3<br>1.1.2      | Take into account the procedures for given <del>unusual/degraded</del> /abnormal and emergency situations.            | 2  | Optional content: ICAO Doc 4444   | APP<br>ACP<br>APS<br>ACS |
| ACS<br>ABES 1.1.4<br>1.1.3      | Take into account that procedures don't exist for all <del>unusual/degraded</del> /abnormal and emergency situations. | 2  | Optional content: real life examples  | ALL                      |
| ACS<br>ABES 1.1.5<br>1.1.4      | Consider how the evolution of a situation may have an impact on safety.   | 2  | Optional content: Separation, Information, Coordination   | ALL                      |

### TOPIC ABES 2 SKILLS IMPROVEMENT

| Subtopic          | ABES 2.1   | Communication effectiveness  |   |     |
|-------------------|--|------------------------------|---|-----|
| ACS<br>ABES 2.1.1 | Ensure effective communication in all circumstances including the case where standard phraseology is not applicable. | 4                            | Phraseology, Vocabulary, Readback, Silence instruction                        | ALL |
| ACS<br>ABES 2.1.2 | Apply change of radiotelephony call sign.  | 3                            | ICAO Doc 4444   | ALL |
| Subtopic          | ABES 2.2   | Avoidance of mental overload |   |     |
| ACS<br>ABES 2.2.1 | Describe actions to keep the control of the situation.   | 2                            | Optional content: sector splitting, holding, flow management, task delegation | ALL |
| ACS<br>ABES 2.2.2 | Organise priority of actions.  | 4                            |   | ALL |

|  |  |   |  |     |
|--|--|---|--|-----|
| ACS<br>ABES 2.2.3  | Ensure an effective circulation of information.  | 4 | <i>Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.</i>  | ALL |
| ACS<br>ABES 2.2.4  | Consider asking for help.  | 2 |  | ALL |
| <b>Subtopic ABES 2.3 Air / ground cooperation</b>  |  |   |  |     |
| ACS<br>ABES 2.3.1  | Collect appropriate information relevant for the situation.  | 3 |  | ALL |
| ACS<br>ABES 2.3.2  | Assist the pilot.  | 3 | <b>Pilot workload</b><br><i>Optional content: Instructions, information, support, human factors, etc.</i>  | ALL |
| <b>TOPIC ABES 3 PROCEDURES FOR <del>UNUSUAL/DEGRADED</del>/ABNORMAL AND EMERGENCY SITUATIONS</b> |  |   |  |     |
| <b>Subtopic ABES 3.1 Application of procedures for <del>UNUSUAL/DEGRADED</del> ABES</b>          |  |   |  |     |
| ACS<br>ABES 3.1.1  | Apply the procedures for given <del>unusual/degraded</del> /abnormal and emergency situations.         | 3 | <i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, <del>GPWS</del> ground based safety nets alerts, airframe failure</i> | ALL |
| <b>Subtopic ABES 3.2 Radio failure</b>   |  |   |  |     |
| ACS<br>ABES 3.2.1  | Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure. | 2 | <b>ICAO Doc 7030</b><br><i>Optional content: military procedures</i>   | ALL |
| ACS<br>ABES 3.2.2  | Apply the procedures to be followed when a pilot experiences complete or partial radio failure.        | 3 | <i>Optional content: Prolonged loss of communication</i>   | ALL |
| <b>Subtopic ABES 3.3 Unlawful interference and aircraft bomb threat</b>                          |  |   |  |     |
| ACS<br>ABES 3.3.1  | Apply ATC procedures associated with unlawful interference and aircraft bomb threat.                   | 3 | <b>ICAO Doc 4444</b>   | ALL |
| <b>Subtopic ABES 3.4 Strayed or unidentified aircraft</b>  |  |   |  |     |
| ACS<br>ABES 3.4.1  | Apply the procedures in the case of strayed aircraft.  | 3 | <b>ICAO Doc 4444</b><br><i>Optional content: Inside controlled airspace, Outside controlled airspace</i>   | ALL |

|  |  |   |  |                          |
|--|--|---|--|--------------------------|
| ACS<br>ABES 3.4.2                            | Apply the procedures in the case of unidentified aircraft.       | 3 | ICAO Doc 4444  | ALL                      |
| <b>Subtopic ABES 3.5 Diversions</b>          |  |   |  |                          |
| ACS<br>ABES 3.5.1                            | Provide navigational assistance to diverting emergency aircraft. | 4 | Track/heading, Distance, Other navigational assistance<br><i>Optional content: Nearest most suitable aerodrome</i> | APP<br>ACP<br>APS<br>ACS |
| <b>Subtopic ABES 3.6 Transponder failure</b> |  |   |  |                          |
| ACS<br>ABES 3.6.1                            | Apply procedures in the event of an SSR transponder failure.     | 3 | ICAO Doc 4444, ICAO Doc 7030<br><i>Optional content: total/partial failure, impact on ADS-B/Mode S capability</i>  | APS<br>ACS               |

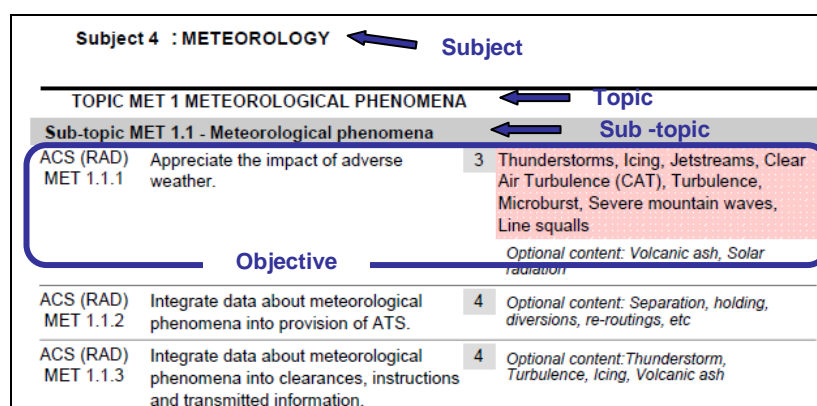
## Supplements

## Supplement 1

### SYLLABI STRUCTURE - HOW TO READ THE TABLES

#### 1. Structure of the Rating training syllabi

- a. Each Rating training has been structured as a syllabus, as follows:
  - i. Each syllabus is divided into subjects, which are divided into topics that are in turn divided into sub-topics. This structure is used to create and classify the objectives. There can be one or several objectives linked to each sub-topic.
  - ii. Objectives are assigned to a specific subject which deals with the knowledge and skills needed to accomplish the subject objective contained in Appendix 9 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(vi). Area Control Surveillance Rating — ACS)



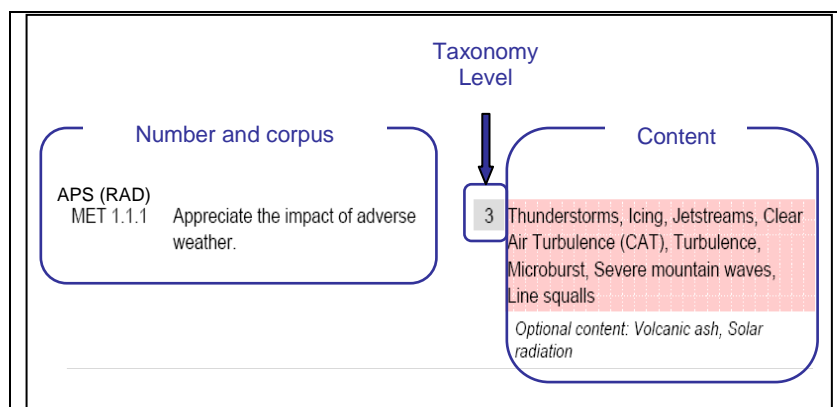
**Figure 1: Layout of syllabus**

- b. The following principles may be applied to the development of a training course that is based on any of the syllabi:
  - i. The structure of the syllabi and the order of the objectives contained within Appendix 9 to Regulation (EU) No .../... is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.
  - ii. No objective from the Basic syllabus is repeated as 'a refresher' in the Rating syllabi.
  - iii. The number of objectives contained within a sub-topic does not necessarily signify how long it should take to teach that sub-topic. For example, a sub-topic containing five relatively straightforward objectives, may take a shorter time to be taught than another sub-topic containing two complex objectives.

#### 2. Structure of objectives

- a. An objective consists of three elements:
  - i. The corpus, which is a description of the required performance. It always contains an action verb to ensure that the outcome is observable. The action verb is always associated with a defined taxonomy.

- ii. The level, which indicates numerically the taxonomy of the action verb.
- iii. The content, which may be implicit or explicit. The explicit content is written in the content field, while the implicit content is not but, instead, is implied in the corpus of the objective and other elements (syllabus, subject, etc.). Content that is a required part of the objective is written in the red shaded field. Optional content, written in italics, may be used if considered appropriate.



**Figure 2: Layout of an objective**

### 3. Repeated and common objectives

- a. Repeated and common objectives are only applicable to Rating training.
- b. To the right of each objective there is an indication of which other ratings contain this particular objective. This indication is the first step to help the training providers in identifying the potential commonalities between the various syllabi. As a second step, the training provider must determine, at the level of local implementation, whether the objective is to be regarded as repeated or common.

| TOPIC MET 1 - METEOROLOGICAL PHENOMENA      |  |   |   |                          |
|---|--|---|---|--------------------------|
| Subtopic MET 1.1 - Meteorological phenomena |  |   |   |                          |
| APS<br>MET 1.1.1                            | Appreciate the impact of adverse weather.                            | 3 | Thunderstorms, Icing, Clear Air Turbulence (CAT), Turbulence, Microburst, Wind shear, Severe mountain waves, Line squalls, Volcanic ash | APP<br>APS               |
| APS<br>MET 1.1.2                            | Integrate data about meteorological phenomena into provision of ATS. | 4 | clearances, instructions and transmitted information<br><i>Optional content: relevant meteorological phenomena</i>                      | ALL                      |
| APS<br>MET 1.1.3                            | Use techniques to avoid adverse weather when necessary/possible.     | 3 | Rerouting, level change, etc.   | APP<br>ACP<br>APS<br>ACS |

**Figure 3: Indication of the ratings that particular objective applies to.**

### 3.1 Repeated objectives

- a. All the objectives appearing in a syllabus are implicitly appropriate to this syllabus. As a consequence, objectives may be repeated 'verbatim' in different rating syllabi and nevertheless specify a different performance. The reader always needs to mentally add the sentence 'in this syllabus context' at the end of each objective.

*For example, the objective 'use approved phraseology' is repeated (same level, same corpus, same content) in all the syllabi but is different because the context is different in each syllabus (a learner able to use approved phraseology for en-route traffic will need additional training before mastering the phraseology in the provision of aerodrome control).*

### 3.2 Common objectives

- a. Common objectives are verbatim the same objectives that appear in more than one rating syllabi in the same context so that they do not need to be taught again in case of combined or successively organised courses.

*For example, the objective 'describe the human information processing model' is common for all the syllabi because the context is non-specific and is therefore not determined by the type of rating.*

- b. As a general principle, the rating subject Human Factors is identical in each Rating training syllabi and can be considered as containing common objectives because the context is always the same. This means that the rating training objectives relating to Human Factors need only be taught once. If a learner is acquiring an additional rating, he/she would not be required to repeat the Human Factors objectives.



#### 4. Action verbs that support the Taxonomy for training objectives:

- a. The five taxonomy levels should be understood to have the following levels of complexity:
- b. Action verbs for Level 1

Level 1 - A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

| L1 Verb          | Definition   | Example  |
|------------------|--|--|
| <b>Define</b>    | State what it is and what its limits are; state the definition | Define ATC service   |
| <b>Draw</b>      | Produce a picture, pattern or diagram                          | Draw the block diagram<br>Draw a holding pattern   |
| <b>List</b>      | Say one after the other  | List the main structure components of an aircraft  |
| <b>Name</b>      | Give name of objects or procedures                             | Name the components of an ILS<br>Name the key national and international aviation organisations. |
| <b>Quote</b>     | Repeat of what is written or said to underline                 | Quote ICAO definition of ATC service   |
| <b>Recognise</b> | To know what it is because you've seen it before               | Recognise the information contained in the different parts of the AIP.                           |
| <b>State</b>     | Say or write in a formal or definite way                       | State the meteorological hazards to aviation.  |

#### c. Action verbs for Level 2

Level 2 - The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

| L2 Verb             | Definition  | Example   |
|---------------------|---|---|
| <b>Characterise</b> | To describe the quality of features in something                                  | Characterise the main items of ATC equipment                            |
| <b>Consider</b>     | To think carefully about it   | Consider the benefits of Critical Incident Stress Management (CISM).    |
| <b>Demonstrate</b>  | Describe and explain; logically or mathematically proves the truth of a statement | Demonstrate the importance of good communications in ATC.               |
| <b>Describe</b>     | Say what it is like or what happened  | Describe the methods by which ICAO notifies and implements legislation. |

|                        |   |  |
|------------------------|---|--|
| <b>Differentiate</b>   | Show the differences between things                                   | Differentiate between different types of visibility.   |
| <b>Explain</b>         | Give details about something or describe so that it can be understood | Explain the purpose and function of ICAO   |
| <b>Take account of</b> | Take into consideration before deciding                               | Take into account the wind influence when calculating a ground speed.<br>Take account of the limitations of equipment and systems. |

## d. Action verbs for Level 3

Level 3 - A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

| L3 Verb           | Definition  | Example  |
|-------------------|---|--|
| <b>Act</b>        | Carry out, execute  | Act to reduce stress.  |
| <b>Apply</b>      | Use something in a situation or activity  | Apply separation.  |
| <b>Appreciate</b> | To understand a situation and know what is involved in a problem-solving situation, to state a plan without applying it                                 | Appreciate the necessity for coordination. (The learner says that the coordination will be done and with whom, he/she does not perform the actual coordination). |
| <b>Assist</b>     | Help somebody to do a job by doing part of it   | Assist the pilot   |
| <b>Calculate</b>  | To discover from information you already have by arithmetic; to think about a possible cause of action in order to form an opinion or decide what to do | Calculate appropriate levels<br>Calculate conversions between the three north designations.  |
| <b>Check</b>      | Make sure the information is correct (satisfactory)   | Check the accuracy of flight data information<br>Check availability of information material.   |
| <b>Choose</b>     | Select out of number, decide to do one thing rather than another  | Choose appropriate levels.<br>Choose which aircraft should be vectored   |
| <b>Collect</b>    | Assemble, accumulate, bring or come together  | Collect examples of different types of error, their causes and consequences in ATC.  |
| <b>Conduct</b>    | Lead, guide   | Conduct coordination   |
| <b>Confirm</b>    | Establish more firmly, corroborate  | Confirm sequence order   |
| <b>Decode</b>     | Turn into ordinary writing, decipher  | Decode the content of weather reports and forecast   |
| <b>Encode</b>     | Put into code or cipher   | Encode and decode flight plans (including supplementary information).  |
| <b>Estimate</b>   | Form an approximate judgement of a number, form an opinion  | Estimate distance and direction between two points   |
| <b>Execute</b>    | Perform action  | Execute corrective actions.  |
| <b>Extract</b>    | Copy out, make extracts from, find, deduce  | Extract pertinent data from relevant sources to produce a flight progress  |

| L3 Verb         | Definition  | Example   |
|-----------------|---|---|
|                 |   | display.  |
| <b>Identify</b> | Associate oneself inseparably with, establish the identity  | Identify the role of ATC as a service provider and the requirements of the ATS users.<br>Identify an aircraft |
| <b>Inform</b>   | Inspire, tell   | Inform supervisor of situation.   |
| <b>Initiate</b> | Begin, set going, originate   | Initiate appropriate coordination   |
| <b>Input</b>    | Enter in the system   | Input data  |
| <b>Issue</b>    | Send forth, publish   | Issue appropriate ATC clearances.<br>Issue appropriate traffic information.                                   |
| <b>Maintain</b> | Carry on, keep up, refresh  | Maintain flight data display  |
| <b>Measure</b>  | Ascertain extent or quality of (thing) by comparison with fixed unit or with object of known size | Measure distance on a map   |
| <b>Monitor</b>  | Keep under observation  | Monitor traffic<br>Monitor the effect of human information processing factors on decision making.             |
| <b>Notify</b>   | Make known, announce, report  | Notify runway in use  |
| <b>Obtain</b>   | Acquire easily, without research  | Obtain meteorological information<br>Obtain information from the relieving controller.                        |
| <b>Operate</b>  | Conduct work on equipment   | Operate the equipment of the controller working position.   |
| <b>Pass</b>     | Move, cause to go, transmit   | Pass essential traffic information without delay  |
| <b>Perform</b>  | Carry into effect, go through, execute  | Perform communication effectively   |
| <b>Process</b>  | To put through the steps of a prescribed procedure  | Process pertinent data on data displays.  |
| <b>Record</b>   | Register, set down for remembrance or reference   | Record information by writing effectively   |
| <b>Relay</b>    | Arrange in, provide with, replace by ...  | Relay meteorological information from pilot reports.  |
| <b>Respond</b>  | Make answer, perform answering or corresponding action  | Respond to loss/doubt concerning identification.<br>Respond to distress and urgency messages and signals.     |
| <b>Scan</b>     | Continuously observe rapidly, sequentially and  | Scan data display   |

| L3 Verb         | Definition   | Example  |
|-----------------|--|--|
|                 | selectively in order to extract relevant data                  |  |
| <b>Transfer</b> | Hand over  | Transfer information to the relieving controller                       |
| <b>Update</b>   | Refresh, bring up-to-date                                      | Update the data display to accurately reflect the traffic situation.   |
| <b>Use</b>      | Employ for a purpose, handle as instrument, put into operation | Use approved phraseology.<br>Use the available means for coordination. |
| <b>Verify</b>   | Establish truth of   | Verify the mode C information  |

## e. Action verbs for Level 4

Level 4 - Ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problem situation. This involves the integration of known applications in a familiar situation.

| L4 Verb           | Definition   | Example   |
|-------------------|--|---|
| <b>Acquire</b>    | Gain by oneself and for oneself, obtain after research | Acquire relevant aeronautical information   |
| <b>Adjust</b>     | Change to a new position, value or setting             | Adjust the surveillance system display  |
| <b>Allocate</b>   | Assign, devote   | Allocate levels (height, altitude, flight level) according to altimetry data.   |
| <b>Analyse</b>    | Examine minutely the constitution of                   | Analyse examples of pilot and controller communication for effectiveness.<br>Analyse the information provided by the radar equipment. |
| <b>Assign</b>     | Allot as a share, make over                            | Assign codes.   |
| <b>Coordinate</b> | Bring part into proper relation                        | Coordinate runway in use.<br>Coordinate in the provision of FIS.  |
| <b>Comply</b>     | Act in accordance with                                 | Comply with rules   |
| <b>Delegate</b>   | Commit authority to somebody                           | Delegate separation to pilots in the case of aircraft executing successive visual approaches.   |
| <b>Detect</b>     | Discover existence of                                  | Detect potential conflict   |
| <b>Ensure</b>     | Make safe, make certain                                | Ensure the agreed course of action is carried out   |
| <b>Expedite</b>   | Assist the progress of, do speedily                    | Expedite traffic  |

| L4 Verb          | Definition  | Example  |
|------------------|---|--|
| <b>Integrate</b> | Combine into a whole, complete by addition of parts         | Integrate appropriate ATC clearances in control service.   |
| <b>Manage</b>    | Handle, wield, conduct                                      | Manage traffic on the manoeuvring area.<br>Manage traffic in accordance with procedural changes. |
| <b>Organise</b>  | Give orderly structure to, frame and put into working order | Organise pertinent data on data displays.<br>Organise priority of actions.                       |
| <b>Predict</b>   | Forecast  | Predict positions of aircraft in the aerodrome traffic and taxi circuits.                        |
| <b>Provide</b>   | Supply, furnish   | Provide radar separation.<br>Provide FIS.  |
| <b>Relate</b>    | Establish link with   | Relate a pressure setting to an altitude   |

## f. Action verbs for Level 5

Level 5 - Ability to analyse new situation in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different from those previously met, requiring judgement and evaluation of options.

| L5 verb          | Definition   | Example   |
|------------------|--|---|
| <b>Assess</b>    | Estimate value or difficulty, evaluate, appraise                                     | Assess workload   |
| <b>Balance</b>   | Weigh (a question, two arguments, etc., against each other)                          | Balance the workload with the traffic demand.   |
| <b>Discuss</b>   | Investigate by reasoning or argument   | Discuss the impact of regulation.   |
| <b>Evaluate</b>  | Ascertain amount of, find numerical expression for                                   | Evaluate the necessary information to be provided to pilots in need of navigational assistance. |
| <b>Interpret</b> | To decide on something's meaning or significance when there is a choice              | Interpret operational information.  |
| <b>Optimise</b>  | To make optimal; get the most out of; use best; modify to achieve maximum efficiency | Optimise the use of support tools.  |
| <b>Resolve</b>   | Solve, clear up, settle  | Resolve conflict  |
| <b>Select</b>    | Pick out as best or most suitable  | Select the runway in use  |

| L5 verb         | Definition   | Example  |
|-----------------|--|--|
| <b>Theorise</b> | Extract general principles from a particular experience                    | Theorise the resolution of conflict between a slow and a fast aircraft |
| <b>Validate</b> | Make valid, ratify, prove valid, show or confirm the validity of something | Validate one radar vectoring option to expedite the traffic            |

g. Application of taxonomy levels to practically-based objectives

- i. Objectives at taxonomy level 3 or higher, which are of a practical nature, related to all subjects except ATM, may be achieved by any suitable type of practical training methods e.g. hands on, plotting on charts, etc.
  - ii. Objectives at taxonomy level 3 or higher, for the ATM subject (Basic and Rating), are practical by nature and require the integration of several knowledge areas and skills at the same time, e.g. vectoring of an aircraft requires knowledge and skills in the areas of radio telephony, aircraft performance, navigation and radar theory. Therefore, ATM level 3 objectives should be achieved through the use of a part task trainer or a simulator.
  - iii. ATM level 4 objectives should be achieved for the most part through the use of a simulator. A part task trainer, which presents operational situations at an enforced pace, may be used to achieve some ATM level 4 objectives.
  - iv. ATM level 5 objectives should be achieved through the use of a simulator.
-

## Supplement 2

### Abbreviations

For the purposes of these AMCs, the following abbreviations and acronyms shall apply:

| Abbreviation | Meaning  |
|--------------|--|
| ABAS         | Aircraft-based Augmentation System (EGNOS)   |
| ACAS         | Airborne Collision Avoidance System  |
| ACC          | Area Control Centre  |
| ACP          | Area Control Procedural Rating   |
| ACFT         | Aircraft (subject)   |
| ACN          | Aircraft Classification Number   |
| ACS          | Area Control Surveillance Rating   |
| ADF          | Automatic Direction Finding System   |
| ADI          | Aerodrome Control Instrument   |
| ADS          | Automatic Dependent Surveillance   |
| ADV          | Aerodrome Control Visual Rating  |
| ADVS         | Advisory Service   |
| AEA          | Association of European Airlines   |
| AFIL         | Air Filed Flight Plan  |
| AFTN         | Aeronautical fixed telecommunication network   |
| AGA          | Aerodromes   |
| AIC          | Aeronautical Information Circular  |
| AIP          | Aeronautical Information Publication   |
| AIRAC        | Aeronautical Information Regulation and Control  |
| AIRAC SUP    | AIRAC Supplement   |
| AIREP        | Air-Report   |
| AIRMET       | Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations |
| AIS          | Aeronautical Information Service   |
| ALRS         | Alerting Service   |
| AMC          | Acceptable Means of Compliance   |
| APM          | Approach Path Monitor  |
| APP          | Approach Control / Centre / Procedural Rating  |
| APS          | Approach Control Surveillance Rating   |
| APV          | Approach Procedure with Vertical guidance  |
| APW          | Area Proximity Warning   |
| ASDA         | Accelerate Stop Distance Available   |



|         |  |
|---------|--|
| ASM     | Airspace Management  |
| ASMGCS  | Advanced Surface Movement Guidance and Control Systems               |
| ATC     | Air Traffic Control  |
| ATCEUC  | Air Traffic Controllers European Unions Co-ordination                |
| ATCO    | Air Traffic Controller   |
| ATCS    | Air Traffic Control Service  |
| ATFCM   | Air Traffic Flow and Capacity Management                             |
| ATFM    | Air Traffic Flow Management  |
| ATIS    | Automatic Terminal Information Service                               |
| ATM     | Air Traffic Management   |
| ATS     | Air Traffic Services   |
| ATZ     | Aerodrome Traffic Zone   |
| AVASI   | Advanced Visual Approach Slope Indicator                             |
| B-RNAV  | Basic Area Navigation  |
| BIRDTAM | Bird hazard NOTAM (NOTAM reporting bird hazard)                      |
| CANSO   | Civil Air Navigation Services Organisation                           |
| CAT     | Clear Air Turbulence   |
| CBA     | Cross Border Area  |
| CBT     | Computer Based Training  |
| CCIS    | Closed Circuit Information System                                    |
| CDR     | Conditional Route  |
| CISM    | Critical Incident Stress Management                                  |
| CPDLC   | Controller Pilot Data Link Communications                            |
| CPL     | Current Flight Plan  |
| D-GPS   | Differential Global Positioning System                               |
| DFTI    | Distance from Touchdown Indicator                                    |
| DME     | Distance Measuring Equipment   |
| Doc     | Document   |
| EAM     | ESARR Advisory Material  |
| EASA    | European Aviation Safety Agency                                      |
| EAT     | Expected Approach Time   |
| EATCHIP | European Air Traffic Control Harmonisation and Integration Programme |
| EATMP   | European Air Traffic Management Programme                            |
| EC      | European Commission  |
| ECAC    | European Civil Aviation Conference                                   |
| EET     | Estimated Elapsed Time   |
| EFIS    | Electronic Flight Instrument System                                  |

|             |  |
|-------------|--|
| EGNOS       | European Geostationary Overlay Service                           |
| EQPS        | Equipment and Systems (subject)                                  |
| ESARR       | Eurocontrol Safety Regulatory Requirements                       |
| ETF         | European Transport Workers' Federation                           |
| EUROCONTROL | European Organisation for the Safety of Air Navigation           |
| FAB         | Functional Airspace Block  |
| FDPS        | Flight Data Processing System                                    |
| FIR         | Flight Information Region  |
| FIS         | Flight Information Service                                       |
| FMS         | Flight Management System   |
| FPB         | Flight Progress Board  |
| FPL         | Flight Plan  |
| FUA         | Flexible Use of Airspace   |
| GAIN Report | Global Aviation Information Network Report                       |
| GBAS        | Ground Based Augmentation System                                 |
| GLONASS     | Global Orbiting Navigation Satellite System                      |
| GNSS        | Global Navigation Satellite System                               |
| GP          | Glide Path   |
| GPS         | Global Positioning System  |
| GPWS        | Ground Proximity Warning System                                  |
| GUI         | Guidelines   |
| HBK         | Handbook   |
| HF          | High Frequency   |
| HUM         | Human Factors (subject)  |
| IACA        | International Air Carrier Association                            |
| IAOPA       | International Council of Aircraft Owner and Pilot Associations   |
| IATA        | International Air Transport Association                          |
| ICAO        | International Civil Aviation Organisation                        |
| IFALPA      | International Federation of Airline Pilots Association           |
| IFATCA      | International Federation of Air Traffic Controllers Associations |
| IFPS        | Integrated Initial Flight Plan Processing System                 |
| IFR         | Instrument Flight Rules  |
| ILS         | Instrument Landing System  |
| IMC         | Instrument Meteorological Conditions                             |
| INS         | Inertial Navigation System                                       |
| INTR        | Introduction to the course (subject)                             |
| IRS         | Inertial Reference System  |
| IRVR        | Instrument Runway Visual Range                                   |

|        |   |
|--------|---|
| ISA    | International Standard Atmosphere                 |
| ITU    | International Telecommunications Union            |
| LAW    | Aviation Law (subject)                            |
| LDA    | Landing Distance Available                        |
| LLZ    | Localizer   |
| LNAV   | Lateral Navigation                                |
| LOA    | Letter of Agreement                               |
| LPV    | Lateral Precision with Vertical guidance approach |
| MET    | Meteorology                                       |
| METAR  | Meteorological Aviation Routine Weather Report    |
| MLS    | Microwave Landing System                          |
| Mode A | SSR identification code                           |
| Mode C | SSR Mode C (Pronounced: Mode Charlie)             |
| Mode S | Mode Select                                       |
| MONA   | Monitoring Aids                                   |
| MSAW   | Minimum Safe Altitude Warning                     |
| MTCD   | Medium Term Conflict Detection                    |
| MWO    | Meteorological Watch Office                       |
| NAV    | Navigation (subject)                              |
| NAVAID | Navigation(al) Aid                                |
| NDB    | Non-Directional Beacon                            |
| No.    | Number  |
| NOTAM  | Notice to Airmen                                  |
| OJT    | On the Job Training                               |
| OLDI   | On-Line Data Interchange                          |
| P-RNAV | Precision Area Navigation                         |
| PANS   | Procedures for Air Navigation Services            |
| PAPI   | Precision Approach Path Indicator                 |
| PAR    | Precision Approach Radar                          |
| PBN    | Performance Based Navigation                      |
| PCN    | Pavement Classification Number                    |
| PEN    | Professional Environment (subject)                |
| PSR    | Primary Surveillance Radar                        |
| PTP    | Part Time Practice                                |
| QDM    | Magnetic Heading                                  |
| QDR    | Magnetic Bearing                                  |
| QFE    | Atmospheric pressure at aerodrome elevation       |
| QNH    | Atmospheric pressure at mean sea level            |

|               |   |
|---------------|---|
| QTF           | The position of the transmitting station according to the bearings taken by the D/F station |
| RAIM          | Receiver Autonomous Integrity Monitoring  |
| RCC           | Rescue Coordination Centre  |
| RDPS          | Radar Data Processing System  |
| RNAV          | Area Navigation   |
| RNP           | Required Navigation Performance   |
| RNP-RNAV      | Required Navigation Performance-Area Navigation   |
| ROC           | Rate of Climb   |
| RPL           | Stored Flight Plan  |
| RTF           | Radio Telephony   |
| RVR           | Runway Visual Range   |
| RVSM          | Reduced Vertical Separation Minimum   |
| SADIS         | Satellite Distribution of World Area Forecast System  |
| SAR           | Search and Rescue   |
| SARPs         | Standards and Recommended Practices (ICAO)  |
| SBAS          | Satellite Based Augmentation System   |
| SELCAL        | Selective Calling   |
| SERA          | Standardised European Rules of the Air  |
| SHELL (model) | Software, Hardware, Environment, Live ware, Live ware Model                                 |
| SID           | Standard Instrument Departure (Route)   |
| SIGMET        | Significant Meteorological Information  |
| SMR           | Surface Movement Radar  |
| SNOWTAM       | NOTAM on SNOW conditions  |
| SPECI         | Aviation Selected Special Weather Report  |
| SRC           | Safety Regulation Commission  |
| SRU           | Safety Regulation Unit  |
| SSR           | Secondary Surveillance Radar  |
| STCA          | Short Term Conflict Alert   |
| SVFR          | Special Visual Flight Rules Flight  |
| TACAN         | UHF Tactical Air Navigation Aid   |
| TAF           | Terminal Area (Aerodrome) Forecast  |
| TCAC          | Tropical Cyclone Advisory Centre  |
| TODA          | Take Off Distance Available   |
| TORA          | Take Off Run Available  |
| TRM           | Team Resource Management  |
| TSA           | Temporary Segregated Area   |
| TWR           | Tower Control Unit (Aerodrome Control Tower)  |

|        |  |
|--------|--|
| UDES   | Unusual Degraded Emergency Situations    |
| UDF    | Ultra High Frequency Direction Finder    |
| UHF    | Ultra High Frequency                     |
| UTC    | Coordinated Universal Time               |
| VAAC   | Volcanic Ash Advisory Centre             |
| VASI   | Visual Approach Slope Indicator          |
| VDF    | Very High Frequency Direction Finder     |
| VFR    | Visual Flight Rules                      |
| VHF    | Very High Frequency                      |
| VMC    | Visual Meteorological Conditions         |
| VNAV   | Vertical Navigation                      |
| VOLMET | Routine Weather Reports Broadcast on VHF |
| VOR    | VHF Omni-directional Radio Range         |
| WAFC   | World Area Forecast Centre               |
| WAFS   | World Area Forecast System               |
| WGS-84 | World Geodetic System 84                 |