MILITARY AIR TRAFFIC CONTROLLER INITIAL TRAINING

Initial training composition Aerodrome Control (ADC)

Edition Number	**1.0**
Edition Date	**03 July 2024**
Status	**Approved**

MILITARY AIR TRAFFIC CONTROLLER WORKING GROUP

DOCUMENT CHANGE RECORD

Edition Number	Edition Date	Status	Reason for change *(detailed)*	Pages affected
1.0	3 July 2024	Approved	Initial issue	All

STATUS

The Status of the document can take 3 values:

Working Draft: Working copy to develop the proposed version or revision of the document.

Draft: Version to be proposed to the ESMAB Policy by the MATCO Working Group

Approved: Final version approved* by the ESMAB Policy for publication.

EDITION

The Edition value of document will have the following template: **Edition X.YY**:

The **value of X** will change after a **major** revision of the document.

The **value of Y** will change after a **minor** revision of the document.

* It should be noted that the approval by ESMAB Policy is given with the clear understanding that the document is legally non-binding and its potential implementation remains fully a decision to be taken at national level.

TABLE OF CONTENTS

COMPOSITION OF MILITARY ATCO INITIAL ADC RATING TRAINING:

For reference use: AMC1 ATCO.D.010(a)(2)(i) Composition of initial ADC rating training[1]

All the following content comes from EASA AMC and includes the amendments coming from the Commission Implementing Regulation (EU) 2023/893 of 21 April 2023 amending Commission Regulation (EU) 2015/340 which was published in the Official Journal of the EU on 4 May 2023. These amendments are drafted according to the EASA regulatory convention for the introduction of changes compared to applicable provisions, i.e.:

~~Red strikethrough~~ = text deleted

Light blue background = new text inserted

Number represents the level of taxonomy as for AMC1 ATCO.D.010(a) (a)(2)(i) Composition of initial training.

The term "National" when used in the composition document should be understood as meaning both civil and military.

Mandatory content should be understood as training content provided in all Member States.

Optional content should be understood as content that might be omitted in Member States where this is not applicable.

Military ATCO Initial Aerodrome Control Rating training should contain the following subjects, topics, subtopics and training objectives using as baseline the subjects, topics and subtopics contained in Appendix 3 to Annex I of amended Commission Regulation (EU) 2015/340 — Aerodrome Control Rating training. This might indeed facilitate the potential latter conversion of Military ATCO licences into Civil Student ATCO licences.

The taxonomy of some of the training objectives identified in AMC1 ATCO.D.010(a)(2)(i) to Commission Regulation (EU) 2015/340 have been highlighted in bright green where they required to be adapted to the working requirements and needs of Military ATCOs.

Additional topics, subtopics and training objectives have also been identified and included in bright yellow in the Initial ADC Rating Training content to take into account the specific training requirements of Military ATCOs.

The composition of the Military ATCO Initial ADC Rating Training as presented in this document are the minimum requirements recommended to be implemented by interested military ATCO training organisations. Any Member State might decide to train its military ATCOs giving one or several of the training objectives a higher level of importance hence a higher taxonomy level.

Despite the fact that this document is legally non-binding, in order to achieve standardisation in the initial training of Military ATCOs, Member States which decide to implement it should apply its content as proposed.

[1] Page 449 of Easy Access Rules dated March 2024

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				
ADC~~I~~ ~~(TWR)~~ INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
Subtopic INTR 1.2 — Course administration				
ADC~~I~~ ~~(TWR)~~ INTR 1.2.1	State how the course is administered.	1		ALL
Subtopic INTR 1.3 — Study material and training documentation				
ADC~~I~~ ~~(TWR)~~ INTR 1.3.1	Use appropriate documents and their sources for course studies.	3	*Optional content: training documentation, library, CBT library, web, learning management server*	ALL
ADC~~I~~ ~~(TWR)~~ INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation *Optional content: supplementary information, library*	ALL

TOPIC INTR 2 — INTRODUCTION TO THE ATC TRAINING COURSE				
Subtopic INTR 2.1 — Course content and organisation				
ADC~~I~~ ~~(TWR)~~ INTR 2.1.1	State the different training methods used during the course.	1	Theoretical training, practical training, self-study, types of training events	ALL
ADC~~I~~ ~~(TWR)~~ INTR 2.1.2	State the subjects covered by the course and their purpose.	1		ALL
ADC~~I~~ ~~(TWR)~~ INTR 2.1.3	Describe the organisation of theoretical training.	2	*Optional content: course programme*	ALL
ADC~~I~~ ~~(TWR)~~ 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				
ADC~~I~~ ~~(TWR)~~ 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				

TOPIC INTR 2 — INTRODUCTION TO THE ATC TRAINING COURSE				
ADC~~I~~ ~~(TWR)~~ 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 and airspace, and appreciate the Licensing and Competence principles.~~

TOPIC LAW 1 — ATCO LICENSING/CERTIFICATE OF COMPETENCE				
Subtopic LAW 1.1 — Privileges and conditions				
ADC~~I (TWR)~~ LAW 1.1.1	Appreciate the conditions which shall be met to issue an Aerodrome Control ~~Instrument~~ rating ~~with Tower Control endorsement~~.	3	Regulation (EU) 2015/340[2] ~~on ATCO Licensing~~ *Optional content: national documents*	ADC~~I~~
ADC~~I (TWR)~~ LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
ADC~~I (TWR)~~ LAW 1.1.3	Explain the conditions for the suspension/revocation of an ATCO licence.	2	Regulation (EU) 2015/340 ~~on ATCO Licensing ,~~ national military regulations and directives	ALL

TOPIC LAW 2 — RULES AND REGULATIONS				
Subtopic LAW 2.1 — Reports				
~~ADI (TWR) LAW 2.1.1~~	~~List the standard forms for reports.~~	~~1~~	~~Air traffic incident report~~ ~~*Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*~~	ALL
ADC~~I (TWR)~~ LAW 2.1.~~2~~1	Describe the functions of, and processes for, reporting.	2	Reporting culture, forms for mandatory and voluntary occurrence reporting ~~air traffic incident report~~, Regulation (EU) No 376/2014[3], Regulation (EU) 2015/1018[4] *Optional content: breach of regulations, watchbook/logbook, records, voluntary reporting, military specific reports.*	ALL
ADC~~I (TWR)~~ LAW 2.1.~~3~~2	Use forms for reporting.	3	Regulation (EU) No 376/2014, forms for mandatory and voluntary occurrence reporting ~~air traffic incident reporting form(s)~~ *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records, military specific reports*	ALL

[2] Commission Regulation (EU) 2015/340 of 20 February 2015 laying down technical requirements and administrative procedures relating to air traffic controllers' licences and certificates pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council, amending Commission Implementing Regulation (EU) No 923/2012 and repealing Commission Regulation (EU) No 805/2011 (OJ L 63, 6.3.2015, p. 1).

[3] Regulation (EU) No 376/2014 of the European Parliament and of the Council of 3 April 2014 on the reporting, analysis and follow-up of occurrences in civil aviation, amending Regulation (EU) No 996/2010 of the European Parliament and of the Council and repealing Directive 2003/42/EC of the European Parliament and of the Council and Commission Regulations (EC) No 1321/2007 and (EC) No 1330/2007 (OJ L 122, 24.4.2014, p. 18).

[4] Commission Implementing Regulation (EU) 2015/1018 of 29 June 2015 laying down a list classifying occurrences in civil aviation to be mandatorily reported according to Regulation (EU) No 376/2014 of the European Parliament and of the Council (OJ L 163, 30.6.2015, p. 1).

TOPIC LAW 2 — RULES AND REGULATIONS				
Subtopic LAW 2.2 — Airspace				
ADC~~I~~ ~~(TWR)~~ LAW 2.2.1	Appreciate airspace classes and structure and their relevance to operations using the Aerodrome Control ~~Instrument~~ rating ~~with Tower Control endorsement~~.	3		ADC~~I~~
ADC~~I~~ ~~(TWR)~~ LAW 2.2.2	Provide planning, coordination and control actions appropriate to the classification and structure of airspace.	4	Military requirements, areas of responsibility (e.g. SVFR, VFR night within a control zone CTR) *Optional content: Regulation (EU) No 923/2012[5], international requirements, civil requirements, ~~military requirements, areas of responsibility~~, sectorisation, national requirements*	ALL
ADC~~I~~ ~~(TWR)~~ LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL

TOPIC LAW 3 — ~~ATC~~ ATS SAFETY MANAGEMENT				
Subtopic LAW 3.1 — Feedback process				
ADC~~I~~ ~~(TWR)~~ LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	*Optional content: voluntary reporting*	ALL
ADC~~I~~ ~~(TWR)~~ LAW 3.1.2	Describe how reported occurrences are analysed.	2	*Optional content: Regulation (EU) No 376/2014, local procedures*	ALL
ADC~~I~~ ~~(TWR)~~ LAW 3.1.3	Name the means used to disseminate recommendations.	1	*Optional content: safety letters, safety boards' web pages*	ALL
ADC~~I~~ ~~(TWR)~~ LAW 3.1.4	Appreciate the just culture ~~'Just Culture'~~ concept.	3	Benefits, prerequisites, constraints *Optional content: ~~https://www.s~~Skybrary~~.aero~~*	ALL
Subtopic LAW 3.2 — Safety ~~I~~investigation				
ADC~~I~~ ~~(TWR)~~ LAW 3.2.1	Describe the role and objectives ~~mission~~ of ~~S~~safety ~~I~~investigation in the improvement of safety.	2		ALL
~~ADI (TWR) LAW 3.2.2~~	~~Define working methods of Safety Investigation.~~	~~1~~		~~ALL~~

[5] Commission Implementing Regulation (EU) No 923/2012 of 26 September 2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigation and amending Implementing Regulation (EU) No 1035/2011 and Regulations (EC) No 1265/2007, (EC) No 1794/2006, (EC) No 730/2006, (EC) No 1033/2006 and (EU) No 255/2010 (OJ L 281, 13.10.2012, p. 1).

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				
Subtopic ATM 1.1 — Aerodrome control service				
ADC~~I~~ ~~(TWR)~~ ATM 1.1.1	Appreciate areas of responsibility.	3	Control zone, traffic circuit, manoeuvring area, movement area, vicinity *Optional content: ATZ*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 1.1.2	Provide aerodrome control service.	4	Regulation (EU) No 923/2012, ~~ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444~~, Regulation (EU) 2017/373[6], operating procedures for the simulated/training environment ~~operation manuals~~ *Optional content: ICAO Annex 11*	~~ADV~~ ADC~~I~~
Subtopic ATM 1.2 — Flight information service (FIS)				
ADC~~I~~ ~~(TWR)~~ ATM 1.2.1	Describe the information that shall be passed on to aircraft by an aerodrome controller.	2	~~ICAO Doc 4444~~ Regulation (EU) 2017/373, *Optional content: ICAO Doc 4444, National military regulations and directives*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 1.2.2	Provide FIS.	4	~~ICAO Doc 4444,~~ Regulation (EU) No 923/2012, Regulation (EU) 2017/373 *Optional content: national documents*	~~ALL~~
ADC~~I~~ ~~(TWR)~~ ATM 1.2.3	Issue appropriate information.	3	~~ICAO Doc 4444,~~ Regulation (EU) 2017/373, essential local traffic, traffic information *Optional content: National military regulations and directives*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 1.2.4	Appreciate the use of ATIS in the provision of FIS~~flight information service~~.	3	Regulation (EU) No 923/2012	~~ADV~~ ~~ADI~~ ~~ALL~~
Subtopic ATM 1.3 — Alerting service (ALRS)				
ADC~~I~~ ~~(TWR)~~ ATM 1.3.1	Provide ALRS.	4	~~ICAO Doc 4444,~~ Regulation (EU) 2017/373, Regulation (EU) No 923/2012 *Optional content: national documents*	ALL
ADC~~I~~ ~~(TWR)~~ ATM 1.3.2	Respond to distress and urgency messages and signals.	3	Regulation (EU) No 923/2012, ICAO Annex 10~~, ICAO Doc 4444~~ *Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ICAO Doc 4444, national documents*	ALL

[6] Commission Implementing Regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, (EU) No 1035/2011 and (EU) 2016/1377 and amending Regulation (EU) No 677/2011 (OJ L 62, 8.3.2017, p. 1).

TOPIC ATM 1 — PROVISION OF SERVICES				
Subtopic ATM 1.4 — ATS system capacity and air traffic flow management (ATFM)				
ADC~~I~~ ~~(TWR)~~ ATM 1.4.1	Appreciate the impact of the ATS system capacity and air traffic flow management on the controller.	3	*Optional content: EUROCONTROL ATFCM Users Manual, slot management, slot allocation procedures, local implementation of ATFCM principles and military operational principles, etc.*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 1.4.2	Organise traffic to take account of flow management.	4	*Optional content: departure sequence*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 1.4.3	Inform the appropriate local ATFM unit or military unit ~~authority~~ of local factors affecting the ATS system capacity and air traffic flow management.	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~~ ADC~~I~~

TOPIC ATM 2 — COMMUNICATION				
Subtopic ATM 2.1 — Effective communication				
ADC ATM 2.1.1	List the communication means between controllers.	1	*Optional content: electronic, written, verbal and non-verbal communication*	ALL
ADC ATM 2.1.2	Select the most suitable means of communication given the situation.	5		ALL
ADC~~I~~ ~~(TWR)~~ ATM 2.1.~~1~~3	Use approved phraseology.	3	Regulation (EU) No 923/2012, Doc 4444 *Optional content: published national/local language phraseology, NATO STANAGS*	ALL
ADC~~I~~ ~~(TWR)~~ ATM 2.1.~~2~~4	Ensure effective communication.	4	Use of plain language when required, communication within the sector/working position, between the sectors/WPs/ATC units ~~Communication techniques~~, readback/verification of readback	ALL
ADC ATM 2.1.5	Analyse examples of pilot–controller communication for effectiveness.	4	*Optional content: real-life recordings, situation in the simulator*	ALL

TOPIC ATM 3 — ATC CLEARANCES AND ATC INSTRUCTIONS				
Subtopic ATM 3.1 — ATC clearances				
ADC~~I~~ ~~(TWR)~~ ATM 3.1.1	Issue appropriate ATC clearances.	3	Regulation (EU) No 923/2012, Regulation (EU) 2017/373, ICAO Doc 4444 *Optional content: ~~ICAO Doc 4444,~~ national documents*	ALL
ADC~~I~~ ~~(TWR)~~ ATM 3.1.2	Integrate appropriate ATC clearances into the control service.	4		ALL

TOPIC ATM 3 — ATC CLEARANCES AND ATC INSTRUCTIONS				
ADC~~I~~ ~~(TWR)~~ ATM 3.1.3	Ensure that the agreed course of action is carried out.	4		ALL
Subtopic ATM 3.2 — ATC instructions				
ADC~~I~~ ~~(TWR)~~ ATM 3.2.1	Issue appropriate ATC instructions.	3	Regulation (EU) No 923/2012, ICAO Doc 4444, Regulation (EU) 2017/373 *Optional content: ~~ICAO Doc 4444~~, national documents*	ALL
ADC~~I~~ ~~(TWR)~~ ATM 3.2.2	Integrate appropriate ATC instructions into the control service.	4		ALL
ADC~~I~~ ~~(TWR)~~ ATM 3.2.3	Ensure that the agreed course of action is carried out.	4		ALL

TOPIC ATM 4 — COORDINATION				
Subtopic ATM 4.1 — Necessity for coordination				
ADC~~I~~ ~~(TWR)~~ ATM 4.1.1	Identify the need for coordination.	3		ALL
Subtopic ATM 4.2 — Tools and methods for coordination				
ADC~~I~~ ~~(TWR)~~ ATM 4.2.1	Use the available tools and methods for coordination.	3	*Optional content: electronic transfer of flight data, telephone, interphone, intercom, direct speech, radiotelephone (RTF), local agreements, automated system coordination, specific military tools*	ALL
Subtopic ATM 4.3 — Coordination procedures				
ADC~~I~~ ~~(TWR)~~ 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~~ Regulation (EU) 2017/373 *Optional content: release point*	ALL
ADC~~I~~ ~~(TWR)~~ ATM 4.3.2	Analyse the 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
ADC~~I~~ ~~(TWR)~~ ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
ADC~~I~~ ~~(TWR)~~ ATM 4.3.4	Ensure that the agreed course of action is carried out.	4		ALL
ADC~~I~~ ~~(TWR)~~ ATM 4.3.5	Coordinate when providing FIS.	4	ICAO Doc 4444, Regulation (EU) 2017/373 ~~*Optional content: ICAO Doc 4444*~~	ALL

TOPIC ATM 4 — COORDINATION				
ADC~~I~~ ~~(TWR)~~ ATM 4.3.6	Coordinate when providing ALRS.	4	ICAO Doc 4444, Regulation (EU) 2017/373 ~~*Optional content: ICAO Doc 4444*~~	ALL
ADC ATMMIL 4.3.7	Describe procedures of silent coordination	2		ALL

TOPIC ATM 5 — ALTIMETRY AND LEVEL ALLOCATION				
Subtopic ATM 5.1 — Altimetry				
ADC~~I~~ ~~(TWR)~~ ATM 5.1.1	Allocate levels according to altimetry data.	4	Regulation (EU) No 923/2012	ALL
ADC~~I~~ ~~(TWR)~~ 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				
ADC~~I~~ ~~(TWR)~~ ATM 5.2.1	Provide planning, coordination and control actions appropriate to the rules for minimum safe height and terrain clearance.	4	*Optional content: terrain clearance dimensions, minimum safe altitudes, transition level, minimum flight level, minimum sector altitude*	AD~~I~~C

TOPIC ATM 6 — SEPARATION~~S~~				
Subtopic ATM 6.1 — Separation between departing aircraft				
ADC~~I~~ ~~(TWR)~~ ATM 6.1.1	Provide separation between departing aircraft.	4	~~ICAO Doc 4444~~ Regulation (EU) 2017/373, military regulations and directives *Optional content: ICAO Doc 4444*	~~ADV~~ ADC~~I~~
Subtopic ATM 6.2 — Separation of departing aircraft from arriving aircraft				
ADC~~I~~ ~~(TWR)~~ ATM 6.2.1	Provide separation of departing aircraft from arriving aircraft.	4	ICAO Doc 4444, Regulation (EU) 2017/373, military regulations and directives	ADC~~I~~
Subtopic ATM 6.3 — Separation of landing aircraft and preceding landing or departing aircraft				
ADC~~I~~ ~~(TWR)~~ ATM 6.3.1	Provide separation of landing aircraft and preceding landing or departing aircraft.	4	ICAO Doc 4444, Regulation (EU) 2017/373, military regulations and directives	~~ADV~~ ADC~~I~~
Subtopic ATM 6.4 — Time-based wake turbulence longitudinal separation				
ADC~~I~~ ~~(TWR)~~ ATM 6.4.1	Provide time-based wake turbulence longitudinal separation.	4	ICAO Doc 4444, Regulation (EU) 2017/373, Regulation (EU) No 923/2012	ADC~~I~~ ~~ADV~~
Subtopic ATM 6.5 — Reduced separation minima				
ADC~~I~~ ~~(TWR)~~ ATM 6.5.1	Provide reduced separation minima.	4	ICAO Doc 4444 Regulation (EU) 2017/373 *Optional content: military regulations and directives*	ADC~~I~~ ~~ADV~~

TOPIC ATM 7 — AIRBORNE ~~COLLISION AVOIDANCE SYSTEMS~~ AND GROUND-BASED SAFETY NETS				
Subtopic ATM 7.1 — Airborne safety nets ~~collision avoidance systems~~				
ADC~~I~~ ~~(TWR)~~ ATM 7.1.1	Recognise the independence of ~~Differentiate between~~ ACAS ~~advisory~~ thresholds and ~~aerodrome~~ ATC separation standards.	~~2~~ 1	ICAO Doc 9863 *Optional content: Skybrary Safety Nets*	~~ADV~~ ~~ADI~~ ALL
ADC~~I~~ ~~(TWR)~~ ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by the pilot.	2	~~ICAO Doc 4444~~ Regulation (EU) No 923/2012 *Optional content: ICAO Doc 4444, ICAO Doc 9863, Skybrary Safety Nets*	ALL
ADC~~I~~ ~~(TWR)~~ ATM 7.1.3	Respond to pilot notification of actions based on airborne systems' warnings.	3	~~TAWS~~ *Optional content: ACAS, ~~EUROCONTROL ACAS web page~~ Skybrary Safety Nets*	~~ALL~~ ADC
Subtopic ATM 7.2 — Ground-based safety nets				
ADC~~I~~ ~~(TWR)~~ ATM 7.2.1	Respond to available ground-based safety nets' warnings.	3	~~*Optional content: anti-incursion*~~	~~ADV~~ ADC~~I~~

TOPIC ATM 8 — DATA DISPLAY				
Subtopic ATM 8.1 — Data management				
ADC~~I~~ ~~(TWR)~~ ATM 8.1.1	Update the data display to accurately reflect the traffic situation.	3	*Optional content: information displayed, strip-marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs*	ALL
ADC~~I~~ ~~(TWR)~~ ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
ADC~~I~~ ~~(TWR)~~ ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
ADC~~I~~ ~~(TWR)~~ ATM 8.1.4	Obtain flight plan information.	3	CPL, ~~FPL,~~ supplementary information *Optional content: FPL, ~~RPL,~~ AFIL, etc.*	ALL
ADC~~I~~ ~~(TWR)~~ ATM 8.1.5	Use flight plan information.	3		ALL

TOPIC ATM 9 — OPERATIONAL ENVIRONMENT (SIMULATED)				
Subtopic ATM 9.1 — Integrity of the operational environment				
ADC~~I~~ ~~(TWR)~~ ATM 9.1.1	Obtain information concerning the operational environment.	3	*Optional content: local/simulator operation manuals, briefing, notices, ~~local orders,~~ current flight plan data/information displays, pilot reports, coordination, verification of information*	ALL

TOPIC ATM 9 — OPERATIONAL ENVIRONMENT (SIMULATED)				
ADC~~I (TWR)~~ ATM 9.1.2	Ensure the integrity of the operational environment.	4	*Optional content: frequency, VOLMET, ATIS, SIGMET, systems' set-up, integrity of displays*	~~ADV~~ ADC~~I~~
Subtopic ATM 9.2 — Verification of the currency of operational procedures				
ADC~~I (TWR)~~ ATM 9.2.1	Check all relevant documentation before managing traffic.	3	*Optional content: briefing, letters of agreement (LoAs), NOTAMs, AICs*	ALL
Subtopic ATM 9.3 — Handover–takeover				
ADC~~I (TWR)~~ ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
ADC~~I (TWR)~~ ATM 9.3.2	Obtain information from the controller handing over.	3		ALL
ADC ATM 9.3.3	List possible actions to provide a safe position handover–takeover.	1	*Optional content: rigour, preparation, overlap time*	ALL
ADC ATM 9.3.4	Explain the consequences of a missed position handover–takeover process.	2		ALL

TOPIC ATM 10 — PROVISION OF ~~AN~~ AERODROME CONTROL SERVICE				
Subtopic ATM 10.1 — Responsibility for the provision				
ADC~~I (TWR)~~ ATM 10.1.1	Explain the responsibility for the provision of ~~an~~ aerodrome control service.	2	~~ICAO Doc 4444 ICAO Annex 11~~ Regulation (EU) 2017/373, Regulation (EU) No 923/2012 *Optional content: ICAO Doc 4444*	~~ADV~~ ADC~~I~~
ADC~~I (TWR)~~ ATM 10.1.2	Describe the division of responsibility among air traffic control units.	2	Regulation (EU) 2017/373 ~~ICAO Doc 4444~~ *Optional content: ICAO Doc 4444*	*ALL*
ADC~~I (TWR)~~ ATM 10.1.3	Describe the responsibility of civil ATCOs in regard to military traffic.	2	ICAO Doc 4444 *Optional content: ICAO Doc 9554*	*ALL*
ADC~~I (TWR)~~ ATM 10.1.4	Describe the responsibility in regard to unmanned free balloons.	2	Regulation (EU) No 923/2012	~~ADV~~ ~~ADI~~ *ALL*
ADC~~I (TWR)~~ ATM 10.1.5	Appreciate the influence of operational requirements.	3	Military flying *Optional content: ~~military flying,~~ calibration flights, aerial photography*	*ALL*
~~**Subtopic ATM 10.2 — Functions of aerodrome control tower**~~				
~~ADI (TWR) ATM 10.2.1~~	~~Manage the general functions of aerodrome control.~~	~~4~~	~~ICAO Doc 4444~~	~~ADV ADI~~

TOPIC ATM 10 — PROVISION OF ~~AN~~ AERODROME CONTROL SERVICE				
~~ADI (TWR) ATM 10.2.2~~	~~Manage the suspension of VFR operations.~~	~~4~~	~~ICAO Doc 4444~~	~~ADV ADI~~
Subtopic ATM 10.~~3~~2 — Traffic management process				
ADC~~I~~ ~~(TWR)~~ ATM 10.~~3~~2.1	Ensure that situational awareness is maintained.	4	Information gathering, observation, traffic projection	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.~~3~~2.2	Detect conflicts in time for appropriate resolution.	4		*ALL*
ADC~~I~~ ~~(TWR)~~ ATM 10.~~3~~2.3	Identify potential solutions to achieve a safe and effective flow of aerodrome traffic.	3		~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.~~3~~2.4	Evaluate possible outcomes of different planning and control actions.	5		~~ADV ADI~~ *ALL*
ADC~~I~~ ~~(TWR)~~ ATM 10.~~3~~2.5	Select an appropriate plan in time to achieve safe and effective flow of aerodrome traffic.	5		~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.~~3~~2.6	Ensure ~~an~~ the adequate prioritisation~~y~~ of actions.	4		*ALL*
ADC~~I~~ ~~(TWR)~~ ATM 10.~~3~~2.7	Execute the selected plan in a timely manner.	3		~~ADV ADI~~ *ALL*
ADC~~I~~ ~~(TWR)~~ ATM 10.~~3~~2.8	Ensure that a safe and efficient outcome is achieved.	4	Traffic monitoring, adaptability and follow-up	*ALL*
Subtopic ATM 10.~~4~~3— Aeronautical ground lights				
ADC~~I~~ ~~(TWR)~~ ATM 10.~~4~~3.1	Select appropriate aeronautical ground lights.	5	Regulation (EU) 2017/373, ICAO Doc 4444, *Optional: special military procedures*	~~ADV~~ ADC~~I~~
Subtopic ATM 10.~~5~~4 — Information to aircraft by the aerodrome control tower				
ADC~~I~~ ~~(TWR)~~ ATM 10.~~5~~4.1	Provide information related to the operation of aircraft.	4	ICAO Doc 4444, Regulation (EU) 2017/373, Regulation (EU) No 255/2010	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.~~5~~4.2	Provide information on aerodrome conditions.	4	ICAO Doc 4444, Regulation (EU) No 923/2012, Regulation (EU) 2017/373 *Optional: national military regulations and directives*	~~ADV~~ ADC~~I~~
Subtopic ATM 10.~~8~~5 — Runway in use				

TOPIC ATM 10 — PROVISION OF ~~AN~~ AERODROME CONTROL SERVICE				
ADC~~I~~ ~~(TWR)~~ ATM 10.~~8~~5.1	Select the runway in use.	5	ICAO Doc 4444, Regulation (EU) 2017/373, Regulation (EU) No 923/2012 *Optional: national military procedures*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.~~8~~5.2	Coordinate the runway in use.	4	*Optional content: approach control, area control, runway selection, change of runway*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.~~8~~5.3	Manage traffic in the event of runway-in-use change.	4	*Optional content: ~~https://www.s~~Skybrary~~.aero~~*	~~ADV~~ ADC~~I~~
Subtopic ATM 10.6 — Control of aerodrome traffic				
ADC~~I~~ ~~(TWR)~~ ATM 10.6.1	Predict positions of aircraft in the aerodrome traffic and taxi circuits.	4	ICAO Doc 4444, Regulation (EU) 2017/373	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.6.2	Manage traffic on the manoeuvring area.	4	ICAO Doc 4444, Regulation (EU) 2017/373 Regulation (EU) No 923/2012~~, aircraft, vehicles~~ *Optional content: runway inspection*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.6.3	Manage traffic in accordance with a change to operational procedures.	4	*Optional content: taxiway closure*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.6.4	Balance the workload against personal capacity.	5	*Optional content: replanning, prioritising solutions, denying requests, delaying traffic*	~~ADV~~ ADC~~I~~
Subtopic ATM 10.7 — Control of airborne traffic ~~in the traffic circuit~~				
ADC~~I~~ ~~(TWR)~~ ATM 10.7.1	Manage traffic in the traffic circuit.	4	ICAO Doc 4444, Regulation (EU) 2017/373 Regulation (EU) No 923/2012, national military regulations and directives~~meteorological phenomena, geographical knowledge, environmental factors~~	~~ADV~~ ADC~~I~~
~~ADI (TWR) ATM 10.7.2~~	~~Manage arriving and departing traffic.~~	~~4~~	~~ICAO Doc 4444, Regulation (EU) No 923/2012, allocation of the order of priority, meteorological phenomena, wake turbulence, environmental factors~~	~~ADV ADI~~
ADC~~I~~ ~~(TWR)~~ ATM 10.7.~~3~~2	Integrate the change in the serviceability of radio aids in the management of aerodrome traffic.	4	*Optional content: limitations, availability and status of ground-based and satellite-based systems ~~UDF, VDF, ILS, NDB, VOR, DME~~*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.7.~~4~~3	Integrate surface conditions into the control of aerodrome traffic.	4	*Optional content: damp, wet, water patches, flooding, snow, slush, ice, braking performance ~~action~~*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ATM 10.7.~~5~~4	Integrate information about meteorological phenomena into the control of aerodrome traffic.	4	*Optional content: clouds, precipitation, visibility, wind, meteorological hazards*	~~ADV~~ ADC~~I~~

TOPIC ATM 10 — PROVISION OF ~~AN~~ AERODROME CONTROL SERVICE				
ADC~~I (TWR)~~ ATM 10.7.~~6~~5	Integrate the information provided by situation displays.	4	~~Use, advantages, disadvantages~~	~~ADV~~ ADC~~I~~
ADC~~I (TWR)~~ ATM 10.7.~~7~~6	Issue ~~Initiate~~ missed approach or go-around instruction.	3	Regulation (EU) No 923/2012, Regulation (EU) 2017/373 *Optional content: obstructed runway*	~~ADV~~ ADC~~I~~
Subtopic ATM 10.8 — Departing traffic				
ADC ATM 10.8.1	Manage departing aircraft.	4	ICAO Doc 4444, Regulation (EU) No 923/2012, Regulation (EU) 2017/373, use of situation displays, allocation of the order of priority, meteorological phenomena, environmental factors, wake turbulence, appropriate departure clearances, SIDs *Optional: national military regulations and directives*	ADC
ADC ATM 10.8.2	Integrate departure sequence into the control of aerodrome traffic.	4	ICAO Doc 4444, Regulation (EU) No 923/2012, Regulation (EU) 2017/373	ADC
ADC ATM 10.8.3	Provide appropriate information to departing traffic.	4	Regulation (EU) 2017/373, Regulation (EU) No 255/2010, use of situation displays, wake turbulence *Optional content: ICAO Doc 4444*	ADC
Subtopic ATM 10.9 — Arriving traffic				
ADC ATM 10.9.1	Manage arriving aircraft.	4	Regulation (EU) 2017/373, Regulation (EU) No 923/2012, use of situation displays, allocation of the order of priority, meteorological phenomena, environmental factors, wake turbulence *Optional content: ICAO Doc 4444, national military regulations and directives*	ADC
ADC ATM 10.9.2	Integrate the approach sequence into the control of aerodrome traffic.	4	Regulation (EU) 2017/373 Regulation (EU) No 923/2012 *Optional: ICAO Doc 4444*	ADC
ADC ATM 10.9.3	Integrate aircraft on visual approach into the aerodrome traffic.	4	Regulation (EU) 2017/373 Regulation (EU) No 923/2012 *Optional: ICAO Doc 4444*	ADC
ADC ATM 10.9.4	Integrate aircraft on missed approach into the aerodrome traffic.	4	*Optional: ICAO Doc 4444*	ADC
ADC ATM 10.9.5	Integrate aircraft performing circling approach into the aerodrome traffic.	4	ICAO Doc 8168 Volume II, ICAO Doc 4444	ADC
ADC ATM 10.9.6	Provide appropriate information to arriving aircraft.	4	Regulation (EU) 2017/373 Regulation (EU) No 923/2012 *Optional: ICAO Doc 4444*	ADC
Subtopic ATM 10.10 — Special VFR (SVFR) operations				
ADC ATM 10.10.1	Manage the suspension of VFR operations.	4	Regulation (EU) 2017/373 *Optional: ICAO Doc 4444*	ADC

TOPIC ATM 10 — PROVISION OF ~~AN~~ AERODROME CONTROL SERVICE				
ADC ATM 10.10.2	Manage SVFR traffic.	4	Regulation (EU) No 923/2012, Regulation (EU) 2017/373 *Optional: ICAO Doc 4444, national military regulations and directives*	ADC
Subtopic ATM 10.11 — Low-visibility operations				
ADC ATM 10.11.1	Describe the procedures for low-visibility operations.	2	Regulation (EU) 2017/373 *Optional: ICAO Doc 4444, national military regulations and directives*	ADC
Subtopic ATM 10.12 — Aerodrome control service with advanced system support				
ADC ATM 10.12.1	Appreciate the impact of advanced systems on the provision of aerodrome control service.	3	*Optional content: surface manager (SMAN), departure manager (DMAN), automated conflict/incursion tools, alarms and resolution advisory tools, automated assistance for surface movement planning and routing, enhanced vision technology in low visibility for controllers*	ADC

~~TOPIC ATM 11 — PROVISION OF AERODROME CONTROL — INSTRUMENT~~				
~~Subtopic ATM 11.1 — Low-visibility operations and special VFR~~				
~~ADI (TWR) ATM 11.1.1~~	~~Manage SVFR traffic.~~	~~4~~	~~Regulation (EU) No 923/2012, ICAO Doc 4444~~	~~*ADV* ADI~~
~~ADI (TWR) ATM 11.1.2~~	~~Describe the procedures for low-visibility operations.~~	~~2~~	~~ICAO Doc 4444~~	~~ADI~~
~~Subtopic ATM 11.2 — Departing traffic~~				
~~ADI (TWR) ATM 11.2.1~~	~~Manage control of departing aircraft.~~	~~4~~	~~ICAO Doc 4444, Regulation (EU) No 923/2012, use of situation displays, wake turbulence, appropriate departure clearances, SIDs~~	~~ADI~~
~~ADI (TWR) ATM 11.2.2~~	~~Integrate departure sequence into the control of aerodrome traffic.~~	~~4~~	~~ICAO Doc 4444, Regulation (EU) No 923/2012~~	~~ADI~~
~~ADI (TWR) ATM 11.2.3~~	~~Provide appropriate information to departing traffic.~~	~~4~~	~~ICAO Doc 4444, Regulation (EU) No 255/2010, use of situation displays, wake turbulence~~	~~ADI~~
~~Subtopic ATM 11.3 — Arriving traffic~~				
~~ADI (TWR) ATM 11.3.1~~	~~Manage control of arriving aircraft.~~	~~4~~	~~ICAO Doc 4444, Regulation (EU) No 923/2012, wake turbulence~~	~~ADI~~
~~ADI (TWR)ATM 11.3.2~~	~~Integrate the approach sequence into the control of aerodrome traffic.~~	~~4~~	~~ICAO Doc 4444, Regulation (EU) No 923/2012~~	~~ADI~~
~~ADI (TWR) ATM 11.3.3~~	~~Integrate aircraft on visual approach into the aerodrome traffic.~~	~~4~~	~~ICAO Doc 4444, Regulation (EU) No 923/2012~~	~~ADI~~
~~ADI (TWR) ATM 11.3.4~~	~~Integrate aircraft on missed approach into the aerodrome traffic.~~	~~4~~	~~Use of air traffic monitors~~	~~ADI~~

TOPIC ATM 11 — PROVISION OF AERODROME CONTROL — INSTRUMENT				
ADI (TWR) ATM 11.3.5	Integrate aircraft performing circling approach into the aerodrome traffic.	4	ICAO Doc 8168 Volume II	ADI
ADI (TWR) ATM 11.3.6	Provide appropriate information to arriving aircraft.	4	ICAO Doc 4444, Regulation (EU) No 923/2012	ADI
Subtopic ATM 11.4 — Aerodrome control service with advanced system support				
ADI (TWR) 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				
ADC~~I~~ ~~(TWR)~~ MET 1.1.1	Appreciate the impact of different cloud types.	3	~~Cumulus,~~ ~~c~~Cumulonimbus *Optional content: stratus, nimbostratus, etc.*	~~ADV~~ ADC~~I~~
ADC MET 1.1.2	Recognise different cloud types.	1		ADC
ADC~~I~~ ~~(TWR)~~ MET 1.1.~~2~~3	Appreciate the impact of precipitation.	3	Precipitation and microphysics *Optional content: rain, snow, sleet, hail*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ MET 1.1.~~3~~4	Appreciate the impact of atmospheric obscurity.	3	*Optional content: advection fog, radiation fog, mixing, evaporation, mist, drizzle*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ MET 1.1.~~4~~5	Appreciate the effect and impact of wind.	3	Gusting, veering, backing *Optional content: land breezes, sea breezes, Föhn*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ MET 1.1.~~5~~6	Appreciate the effect and danger of hazardous meteorological phenomena.	3	Wind shear, turbulence, thunderstorms, icing, microbursts	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ MET 1.1.~~6~~7	Appreciate the effect of a frontal system on aerodrome operations.	3		~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ MET 1.1.~~7~~8	Integrate data about meteorological phenomena into the provision of ATS.	4	Clearances, instructions and transmitted information *Optional content: relevant meteorological phenomena*	~~ALL~~

TOPIC MET 2 — SOURCES OF METEOROLOGICAL DATA				
Subtopic MET 2.1 — Meteorological instruments				
ADC~~I~~ ~~(TWR)~~ MET 2.1.1	Extract information from meteorological instruments.	3	*Optional content: anemometer, RVR indicator, cloud base indicator, ceilometer, barometer*	~~ADV~~ ADC~~I~~
Subtopic MET 2.2 — Other sources of meteorological data				
ADC~~I~~ ~~(TWR)~~ MET 2.2.1	Decode information from meteorological data displays.	3		~~ALL~~

TOPIC MET 2 — SOURCES OF METEOROLOGICAL DATA				
ADC~~I~~ ~~(TWR)~~ MET 2.2.2	Use appropriate communication tools and networks to obtain meteorological data.	3		~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ MET 2.2.3	Relay meteorological information.	3	ICAO Doc 4444, Regulation (EU) No 923/2012 *Optional content: flight information centre, adjacent ATS unit, ADS-C reports*	*ALL*

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				
ADC~~I~~ ~~(TWR)~~ NAV 1.1.1	Decode symbols and information displayed on aeronautical maps and charts.	3	Military maps and charts, Instrument approach charts, SID & STAR charts, aerodrome charts *Optional content: visual approach charts*	ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ NAV 1.1.2	Use relevant maps and charts.	3		~~ADI~~ *ALL*

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
Subtopic NAV 2.1 — Navigational systems				
ADC~~I~~ ~~(TWR)~~ NAV 2.1.1	Describe how the operational status of navigational systems may change.	2	*Optional content: VDF, NDB, VOR, DME, ILS, ABAS, SBAS, GBAS, RNP, TACAN*	ADC~~I~~
ADC~~I~~ ~~(TWR)~~ NAV 2.1.~~3~~2	Appreciate the effect of a change on the operational status of navigational systems.	3	*Optional content: precision, limitations, status, degraded procedures*	*ALL*
ADC~~I~~ ~~(TWR)~~ NAV 2.1.~~2~~3	Decode operational status displays of navigational systems.	3	*Optional content: VDF, NDB, VOR, DME, ILS, ~~and~~ GBAS, TACAN*	ADC~~I~~
~~ADI (TWR) NAV 2.1.4~~	~~Manage traffic in case of change in the operational status of navigational systems.~~	~~4~~	~~*Optional content: limitations, availability and status of ground-based and satellite-based systems*~~	~~ADI~~
Subtopic NAV 2.2 — Stabilised approach				
ADC~~I~~ ~~(TWR)~~ NAV 2.2.1	Describe the concept of stabilised approach.	2	*Optional content: ~~https://www.s~~Skybrary~~.aero~~*	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ NAV 2.2.2	Appreciate the effect of late change of runway-in-use for landing aircraft.	3	Cockpit workload *Optional content: impact on vertical profile (CDO), FMS management, crew procedure briefing, missed approach, loss of situational awareness, etc.*	~~ADV~~ ADC~~I~~
Subtopic NAV 2.3 — Instrument departures and arrivals				
ADC~~I~~ ~~(TWR)~~ NAV 2.3.1	Describe relevant SIDs.	2		~~ADI APP APS~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ NAV 2.3.2	Describe the types and phases of ~~an~~ instrument approach procedures.	2	Regulation (EU) 2017/373, ICAO Annex 6 *Optional content: military procedures (e.g. formation flights)*	ADC~~I~~ APP APS

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
ADC~~I~~ ~~(TWR)~~ NAV 2.3.3	Describe the relevant minima applicable for a precision/non-precision and visual approach.	2	*Optional content: Type A/B operations, CAT I/II/III criteria, LNAV, LNAV/VNAV, LPV, RNP AR APCH minima, GCA, PAR*	ADC~~I~~ APP APS
Subtopic NAV 2.4 — Satellite-based systems				
ADC~~I~~ ~~(TWR)~~ NAV 2.4.1	State the different applications of satellite-based systems relevant for aerodrome operations.	1	*Optional content: LNAV, LNAV/VNAV, LPV, RNP minima, precision approach*	AD~~I~~C
Subtopic NAV 2.5 — PBN applications				
ADC~~I~~ ~~(TWR)~~ NAV 2.5.1	State future PBN developments.	1	A-RNP, RNP (AR) DEP *Optional content: RNP 3D, VNAV, 4D, TBO*	~~*ADI APP ACP APS ACS*~~ *ALL*

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				
ADC~~I~~ ~~(TWR)~~ ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot into the provision of ATS.	4		ALL
ADC~~I~~ ~~(TWR)~~ ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	*Optional content: radios (number of), emergency radios*	ALL
ADC~~I~~ ~~(TWR)~~ ACFT 1.1.3	Explain the operation of on-board surveillance equipment.	2	Transponders: equipment Mode A, Mode C, Mode S, ADS capability	ADC~~I~~ APS ACS

TOPIC ACFT 2 — AIRCRAFT CATEGORIES				
Subtopic ACFT 2.1 — Wake turbulence				
ADC~~I~~ ~~(TWR)~~ ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to succeeding aircraft.	2		ALL
ADC~~I~~ ~~(TWR)~~ ACFT 2.1.2	Appreciate the techniques used to prevent hazards associated with wake turbulence to succeeding aircraft.	3		ALL
Subtopic ACFT 2.2 — Application of the ICAO approach categories				
ADC~~I~~ ~~(TWR)~~ ACFT 2.2.1	Describe the use of the ICAO approach categories.	2	ICAO Doc 8168	ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ ACFT 2.2.2	Appreciate the effect of the ICAO approach categories on the traffic organisation ~~of traffic~~.	3		ADC~~I~~ APP APS

TOPIC ACFT 3 — FACTORS AFFECTING AIRCRAFT PERFORMANCE				
Subtopic ACFT 3.1 — Take-off factors				
ADC~~I~~ ~~(TWR)~~ 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, aircraft configuration, airframe contamination and aircraft mass*	~~ADV~~ ADC~~I~~
Subtopic ACFT 3.2 — Climb factors				
ADC~~I~~ ~~(TWR)~~ ACFT 3.2.1	Appreciate the influence of factors affecting aircraft during climb.	3	*Optional content: speed, mass, air density, wind and temperature*	~~ADV~~ ADC~~I~~

TOPIC ACFT 3 — FACTORS AFFECTING AIRCRAFT PERFORMANCE				
Subtopic ACFT 3.3 — Final approach and landing factors				
ADC~~I~~ ~~(TWR)~~ ACFT 3.3.1	Integrate the influence of factors affecting aircraft during final approach and landing.	4	*Optional content: wind, aircraft configuration, mass, meteorological conditions, runway conditions, runway slope, aerodrome elevation, specific military procedures*	~~ADV~~ ADC~~I~~
Subtopic ACFT 3.4 — Economic factors				
ADC~~I~~ ~~(TWR)~~ ACFT 3.4.1	Integrate consideration of economic factors affecting aircraft.	4	*Optional content: starting-up, taxiing, routing, departure sequence*	~~ADV~~ ADC~~I~~
Subtopic ACFT 3.5 — Environmental factors				
ADC~~I~~ ~~(TWR)~~ ACFT 3.5.1	Appreciate the performance restrictions due to environmental constraints.	3	*Optional content: noise-abatement procedures, minimum flight altitudes, bird strike hazard, specific military limitations*	~~ADV~~ ADC~~I~~
Subtopic ACFTMIL 3.6 – Operational factors				
ADC ACFTMIL 3.6.1	Appreciate the performance restrictions due to operational factors.	3	Supersonic	ALL

TOPIC ACFT 4 — AIRCRAFT DATA				
Subtopic ACFT 4.1 — Recognition of aircraft types				
ADC~~I~~ ~~(TWR)~~ 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, NATO publications *Optional content: ICAO approach categories*	ADC~~I~~
Subtopic ACFT 4.2 — Performance data				
ADC~~I~~ ~~(TWR)~~ 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 control service.	4	Performance data under a representative variety of circumstances	~~ADV~~ ~~ADI~~ *ALL*

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 — INFORMATION PROCESSING ~~PSYCHOLOGICAL FACTORS~~				
Subtopic HUM 1.1 — Cognition~~ve~~ and factors influencing it				
ADC~~I~~ ~~(TWR)~~ HUM 1.1.1	Describe the human information-processing model.	2	Attention, perception, memory, situational awareness, decision-making, response	ALL
ADC~~I~~ ~~(TWR)~~ 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) 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~~
Subtopic HUM 1.2 — Situational awareness				
ADC HUM 1.2.1	Appreciate the effect of human information-processing factors on situational awareness.	3	*Optional content: workload, knowledge, interpersonal relations, distraction, confidence, experience, fatigue, stress*	ALL
Subtopic HUM 1.3 — Decision-making				
ADC HUM 1.3.1	Appreciate 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 AFFECTING HEALTH AND WELL-BEING				
Subtopic HUM 2.1 — Fatigue				
~~ADI (TWR) HUM 2.1.1~~	~~State factors that cause fatigue.~~	~~1~~	~~Shift work *Optional content: night shifts and rosters, Regulation (EU) 2017/373[7], ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*~~	~~ALL~~
ADC~~I~~ ~~(TWR)~~ HUM 2.1.~~2~~1	Describe the onset of fatigue.	2	Regulation (EU) 2017/373 *Optional content: lack of concentration, listlessness, irritability, frustration, Skybrary Human Behaviour: EUROCONTROL Fatigue and sleep management ~~ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers~~*	ALL
ADC~~I~~ ~~(TWR)~~ HUM 2.1.~~3~~2	Recognise the onset of fatigue in self and in others.	1	*Optional content: ~~ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers~~ Skybrary Human Behaviour: EUROCONTROL Fatigue and sleep management*	ALL

~~[7] Commission Implementing Regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, (EU) No 1035/2011 and (EU) 2016/1377 and amending Regulation (EU) No 677/2011 (OJ L 62, 8.3.2017, p. 1).~~

TOPIC HUM 2 — ~~MEDICAL AND PHYSIOLOGICAL~~ FACTORS AFFECTING HEALTH AND WELL-BEING				
~~ADI (TWR) HUM 2.1.4~~	~~Recognise the onset of fatigue in others.~~	~~1~~		~~ALL~~
ADC~~I (TWR)~~ HUM 2.1.~~5~~3	Describe the appropriate action when recognising fatigue.	2	*Optional content: Skybrary Human Behaviour: EUROCONTROL Fatigue and sleep management*	ALL
~~**Subtopic HUM 2.2 — Fitness**~~				
~~ADI (TWR) HUM 2.2.1~~	~~Recognise signs of lack of personal fitness.~~	~~1~~		~~ALL~~
~~ADI (TWR) HUM 2.2.2~~	~~Describe actions when aware of a lack of personal fitness.~~	~~2~~		~~ALL~~
Subtopic HUM 2.2 — Stress				
ADC HUM 2.2.1	Recognise the effects of stress on human performance.	1	Stress and its symptoms in self and in others *Optional content: Regulation (EU) 2017/373*	ALL
ADC HUM 2.2.2	Describe the appropriate action when recognising stress.	2		ALL
ADC HUM 2.2.3	Act to reduce stress.	3		ALL
ADC HUM 2.2.4	Respond to stressful situations by offering, asking for or accepting assistance.	3		ALL
ADC HUM 2.2.5	Recognise the effects of stressful events.	1	Self and others, abnormal situations	ALL

TOPIC HUM 3 — THREAT AND ERROR MANAGEMENT				
Subtopic HUM 3.1 — Threat and error management framework				
ADC HUM 3.1.1	Explain the importance of threat and error management.	2	*Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practices*	ALL
ADC HUM 3.1.2	Explain the threat and error management framework.	2	Threats, errors, undesired states, countermeasures *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADC HUM 3.1.3	Differentiate between the different types of threats in ATC.	2	Internal, external, airborne, environmental *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADC HUM 3.1.4	Differentiate between the different types of errors in ATC.	2	Equipment, procedural, communication *Optional content: Increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences*	ALL

TOPIC HUM 3 — THREAT AND ERROR MANAGEMENT				
ADC HUM 3.1.5	Differentiate between the different types of undesired states.	2	On the ground, airborne *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADC HUM 3.1.6	Analyse examples of threat and error management in ATC.	4	Case studies *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
Subtopic HUM 3.2 — Application of threat and error management				
ADC HUM 3.2.1	Manage threats.	4	Detect and respond *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADC HUM 3.2.2	Manage errors.	4	Detect and respond *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADC HUM 3.2.3	Manage undesired states.	4	Detect and respond *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL

~~TOPIC HUM 3 — SOCIAL AND ORGANISATIONAL FACTORS~~				
~~Subtopic HUM 3.1 — Team resource management (TRM)~~				
~~ADI (TWR) HUM 3.1.1~~	~~State the relevance of TRM.~~	~~1~~	~~*Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training*~~	~~ALL~~
~~ADI (TWR) HUM 3.1.2~~	~~State the content of the TRM concept.~~	~~1~~	~~*Optional content: teamwork, human error, team roles, stress, decision-making, communication, situational awareness*~~	~~ALL~~
~~Subtopic HUM 3.2 — Teamwork and team roles~~				
~~ADI (TWR) HUM 3.2.1~~	~~Identify reasons for conflict.~~	~~3~~		~~ALL~~
~~ADI (TWR) HUM 3.2.2~~	~~Describe actions to prevent human conflicts.~~	~~2~~	~~*Optional content: TRM team roles*~~	~~ALL~~
~~ADI (TWR) 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~~				
~~ADI (TWR) 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~~
~~ADI (TWR) HUM 3.3.2~~	~~Apply responsible judgement.~~	~~3~~	~~Case study and discussion about a dilemma situation~~	~~ALL~~

TOPIC HUM 4 — TEAMWORK ~~STRESS~~				
Subtopic HUM 4.1 — Benefits of teamwork ~~Stress~~				

TOPIC HUM 4 — TEAMWORK ~~STRESS~~				
~~ADI (TWR) HUM 4.1.1~~	~~Recognise the effects of stress on performance.~~	~~1~~	~~Stress and its symptoms in self and in others~~ ~~*Optional content: Regulation (EU) 2017/373*~~	~~ALL~~
ADC HUM 4.1.1	State the benefits of teamwork.	1	Increased safety, efficiency and capacity	ALL
ADC HUM 4.1.2	List the controller's human performance elements affected by teamwork.	1	Situational awareness, communication, decision-making, threat and error management, workload management	ALL
Subtopic HUM 4.2 — Conflict ~~Stress~~ management				
~~ADI (TWR) 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) HUM 4.2.2~~	~~Respond to stressful situations by offering, asking or accepting assistance.~~	~~3~~	~~*Optional content: the benefits of offering, accepting and asking for help in stressful situations*~~	~~ALL~~
~~ADI (TWR) HUM 4.2.3~~	~~Recognise the effect of shocking and stressful events.~~	~~1~~	~~Self and others, abnormal situations, Critical Incident Stress Management (CISM)~~	~~ALL~~
~~ADI (TWR) HUM 4.2.4~~	~~Consider the benefits of Critical Incident Stress Management (CISM).~~	~~2~~		~~ALL~~
~~ADI (TWR) HUM 4.2.5~~	~~Explain procedures to be used following an incident/accident.~~	~~2~~	~~*Optional content: CISM, counselling, human element*~~	~~ALL~~
ADC HUM 4.2.1	Identify the reasons for conflict.	3		ALL
ADC HUM 4.2.2	Describe strategies to cope with human conflicts.	2	*Optional content: in your team, in the simulator*	ALL
ADC HUM 4.2.3	Describe actions to prevent human conflicts.	2		ALL

TOPIC HUM 5 — SYSTEMS				
Subtopic HUM 5.1 — Concept of systems in ATM/ANS				
ADC HUM 5.1.1	Explain the concept of systems.	2	People; procedures; equipment; ATM in system terms: simple, complicated, and complex systems; system thinking	ALL
ADC HUM 5.1.2	Describe how changes in one part of a system may impact the other parts.	2		ALL
ADC HUM 5.1.3	Describe the role of the human in the system.	2		ALL

~~TOPIC HUM 5 — HUMAN ERROR~~				
~~**Subtopic HUM 5.1 — Human error**~~				

~~TOPIC HUM 5 — HUMAN ERROR~~				
~~ADI (TWR) 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~~ ~~*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*~~	~~ALL~~
~~ADI (TWR) HUM 5.1.2~~	~~Differentiate between the types of error.~~	~~2~~	~~Slips, lapses, mistakes~~ ~~*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*~~	~~ALL~~
~~ADI (TWR) HUM 5.1.3~~	~~Describe error-prone conditions.~~	~~2~~	~~*Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences*~~	~~ALL~~
~~ADI (TWR) HUM 5.1.4~~	~~Collect examples of different error types, their causes and consequences for ATC.~~	~~3~~	~~*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*~~	~~ALL~~
~~ADI (TWR) HUM 5.1.5~~	~~Explain how to detect errors to compensate for them.~~	~~2~~	~~STCA, MSAW, individual and collective strategy~~ ~~*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*~~	~~ALL~~
~~ADI (TWR) HUM 5.1.6~~	~~Execute corrective actions.~~	~~3~~	~~Error compensation~~ ~~*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*~~	~~ALL~~
~~ADI (TWR) HUM 5.1.7~~	~~Explain the importance of error management.~~	~~2~~	~~*Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practices*~~	~~ALL~~
~~ADI (TWR) HUM 5.1.8~~	~~Describe the impact on an ATCO's performance following an occurrence/incident.~~	~~2~~	~~*Optional content: reporting, SMS, investigation, CISM*~~	~~ALL~~
~~**Subtopic HUM 5.2 — Violation of rules**~~				
~~ADI (TWR) HUM 5.2.1~~	~~Explain the causes and dangers of violation of rules becoming accepted as a practice.~~	~~2~~	~~*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*~~	~~ALL~~

TOPIC HUM 6 — COMMUNICATION ~~COLLABORATIVE WORK~~				
Subtopic HUM 6.1 — Effective communication				
ADC HUM 6.1.1	Explain effective communication in ATC operations.	2	ICAO Doc 9868	ALL
~~ADCI (TWR) HUM 6.1.1~~	~~Use communication effectively in ATC.~~	~~3~~		~~ALL~~
ADC HUM 6.1.2	Explain key strategies used to enable open communication.	2	*Optional content: active listening, active speaking, assertiveness, honesty, relevance, facts, neutrality*	ALL
~~ADCI (TWR) HUM~~	~~Analyse examples of pilot–controller communication for effectiveness.~~	~~4~~		~~ALL~~

TOPIC HUM 6 — COMMUNICATION ~~COLLABORATIVE WORK~~				
~~6.1.2~~				
ADC HUM 6.1.3	Describe the parameters affecting the controller's competence to communicate effectively.	2	Workload, mutual knowledge, controller versus pilot mental picture, distractions, sound, human conflicts *Optional content: communication between and within the team(s), in the simulator, with the pilots, instructors, coordination partners*	ALL
Subtopic HUM 6.2 — Effective feedback				
ADC HUM 6.2.1	Define feedback.	1		ALL
ADC HUM 6.2.2	Explain the purpose of receiving and giving feedback, and its effect on performance.	2		ALL
ADC HUM 6.2.3	Consider the impact of communication styles on feedback and on conflict resolution.	2		ALL
ADC HUM 6.2.4	Integrate feedback into performance.	4		ALL
~~**Subtopic HUM 6.2 — Collaborative work within the same area of responsibility**~~				
~~ADI (TWR) HUM 6.2.1~~	~~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~~
~~ADI (TWR) HUM 6.2.2~~	~~Explain consequences of the use of communication means on effectiveness.~~	~~2~~	~~*Optional content: strip legibility and encoding, label designation, feedback*~~	~~ALL~~
~~ADI (TWR) HUM 6.2.3~~	~~List possible actions to provide a safe position handover.~~	~~1~~	~~*Optional content: rigour, preparation, overlap time*~~	~~ALL~~
~~ADI (TWR) HUM 6.2.4~~	~~Explain consequences of a missed position handover process.~~	~~2~~		~~ALL~~
~~**Subtopic HUM 6.3 — Collaborative work between different areas of responsibility**~~				
~~ADI (TWR) HUM 6.3.1~~	~~List factors and means for an effective coordination between sectors and/or tower positions.~~	~~1~~	~~*Optional content: other sectors' constraints, electronic coordination tools*~~	~~ALL~~
~~**Subtopic HUM 6.4 — Controller–pilot cooperation**~~				
~~ADI (TWR) HUM 6.4.1~~	~~Describe parameters affecting controller–pilot cooperation.~~	~~2~~	~~*Optional content: workload, mutual knowledge, controller versus pilot mental picture*~~	~~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				
ADC~~/~~ ~~(TWR)~~ EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, procedures *Optional content: frequency selection, standby equipment*	ALL
ADC~~/~~ ~~(TWR)~~ EQPS 1.1.2	Identify indications of operational status of radio equipment.	3	*Optional content: indicator lights, serviceability displays, selector/frequency displays, encrypted radio frequency*	ALL
Subtopic EQPS 1.2 — Other voice communications				
ADC~~/~~ ~~(TWR)~~ 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)				
ADC~~/~~ ~~(TWR)~~ EQPS 2.1.1	Decode AFTN messages.	3	*Optional content: movement and control messages, NOTAMs, SNOWTAMs, BIRDTAMs, etc.*	ALL
Subtopic EQPS 2.2 — Automatic data interchange				
ADC~~/~~ ~~(TWR)~~ EQPS 2.2.1	Use automatic data transfer equipment where available.	3	*Optional content: sequencing systems, automated information and coordination, OLDI*	~~ADV~~ ADC~~/~~ APS ACS
ADC~~/~~ ~~(TWR)~~ EQPS 2.2.2	Explain operational application of CPDLC for departure clearance (DCL) delivery and D-ATIS.	2	ICAO Doc 9694	~~ADV~~ ADC~~/~~

TOPIC EQPS 3 — CONTROLLER WORKING POSITION				
Subtopic EQPS 3.1 — Operation and monitoring of equipment				
ADC~~/~~ ~~(TWR)~~ EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, responsibilities	ALL
ADC~~/~~ ~~(TWR)~~ 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, UDF/VDF*	ALL
ADC~~/~~ ~~(TWR)~~ EQPS 3.1.3	Operate the available equipment in abnormal and emergency situations.	3		ALL
Subtopic EQPS 3.2 — Situation displays and information systems				

TOPIC EQPS 3 — CONTROLLER WORKING POSITION				
ADC~~I (TWR)~~ EQPS 3.2.1	Use situation displays.	3		ALL
ADC~~I (TWR)~~ EQPS 3.2.2	Check the availability of information.	3		ALL
ADC~~I (TWR)~~ EQPS 3.2.3	Obtain information from equipment.	3	*Optional content: information from wind direction indicator*	~~ADV~~ ADC~~I~~
ADC~~I (TWR)~~ EQPS 3.2.4	Take account of anti-incursion equipment.	2		ADC~~I~~
ADC~~I (TWR)~~ EQPS 3.2.5	Explain the use of ASMGCS.	2		ADC~~I~~
Subtopic EQPS 3.3 — Flight data systems				
ADC~~I (TWR)~~ EQPS 3.3.1	Use the flight data information at the controller working position.	3		ALL

TOPIC EQPS 4 — FUTURE EQUIPMENT				
Subtopic EQPS 4.1 — New developments				
ADC~~I (TWR)~~ EQPS 4.1.1	Recognise future developments.	1	New advanced systems *Optional content: European ATM Master Plan, European Plan for Aviation Safety*	ALL

TOPIC EQPS 5 — EQUIPMENT AND SYSTEMS' LIMITATIONS AND DEGRADATION				
Subtopic EQPS 5.1 — Reaction to limitations				
ADC~~I (TWR)~~ EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
ADC~~I (TWR)~~ EQPS 5.1.2	Respond to technical deficiencies of the operational position.	3	Notification procedures, responsibilities	ALL
Subtopic EQPS 5.2 — Communication equipment degradation				
ADC~~I (TWR)~~ EQPS 5.2.1	Identify that communication equipment has degraded.	3	*Optional content: ground–air, ground–ground and landline communications*	~~ADV~~ ~~ADI~~
ADC~~I (TWR)~~ EQPS 5.2.2	Apply contingency procedures in the event of communication equipment degradation.	4	*Optional content: procedures for total or partial degradation of ground–air, ground–ground and landline*	~~ADV~~ ~~ADI~~ ALL

TOPIC EQPS 5 — EQUIPMENT AND SYSTEMS' LIMITATIONS AND DEGRADATION				
			communications; alternative methods of transferring data	
Subtopic EQPS 5.3 — Navigational equipment degradation				
ADC~~I~~ ~~(TWR)~~ EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	*Optional content: ~~VOR,~~ navigational aids,* 'European GNSS Contingency/Reversion Handbook for PBN Operations'	ALL
ADC~~I~~ ~~(TWR)~~ EQPS 5.3.2	Apply 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~~ ~~APP~~ ~~ACP~~ ~~APS~~ ~~ACS~~ ALL

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				
Subtopic PEN 1.1 — Study visit to an aerodrome				
ADC~~I~~ ~~(TWR)~~ PEN 1.1.1	Appreciate the functions and provision of operational aerodrome control services.	3	Study visit to a TWR	~~ADV~~ ADC~~I~~

TOPIC PEN 2 — AIRSPACE USERS				
Subtopic PEN 2.1 — Contributors to civil ATS operations				
ADC~~I~~ ~~(TWR)~~ PEN 2.1.1	Characterise civil ATS activities at an aerodrome.	2	~~*Study visit to a TWR*~~ *Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ PEN 2.1.2	Characterise other parties interfacing with ATS operations.	2	*Optional content: familiarisation visits to engineering services, firefighting and emergency services, airline operations offices*	ALL
Subtopic PEN 2.2 — Contributors to military ATS operations				
ADC~~I~~ ~~(TWR)~~ PEN 2.2.1	Characterise military ATS activities.	2	*Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, ~~A~~air ~~D~~defence ~~U~~units*	ALL

TOPIC PEN 3 — CUSTOMER RELATIONS				
Subtopic PEN 3.1 — Provision of services and user requirements				
ADC~~I~~ ~~(TWR)~~ PEN 3.1.1	Appreciate ~~Identify~~ the role of an air navigation ~~ATC as a~~ service provider.	3	Regulation (EU) 2018/1139[8]	ALL
ADC~~I~~ ~~(TWR)~~ PEN 3.1.2	Appreciate ATS users' requirements.	3		ALL

TOPIC PEN 4 — ENVIRONMENTAL PROTECTION				
Subtopic PEN 4.1 — Environmental protection				
ADC~~I~~ ~~(TWR)~~ PEN 4.1.1	Describe the environmental constraints on aerodrome operations.	2	*Optional content: ICAO Doc 10013 ~~Circular 303~~ — Operational opportunities to reduce ~~Minimize~~ fuel burn ~~Use~~ and ~~Reduce~~ emissions, Hot Cargo Parking*	~~ADV~~ ADC~~I~~ APP APS

[8] Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91.

TOPIC PEN 4 — ENVIRONMENTAL PROTECTION				
ADC~~I~~ ~~(TWR)~~ PEN 4.1.2	Define ~~explain the use of~~ the Collaborative Environmental Management (CEM) process at aerodromes.	~~2~~ 1	*Optional content: European ATM Master Plan, EUROCONTROL CEM Specification*	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ 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, noise preferential routes, flight efficiency, protection zones*	~~ADV~~ ADC~~I~~ APP

SUBJECT 10: ABNORMAL AND EMERGENCY SITUATIONS

~~The subject objective is:~~
~~Learners shall develop a professional attitude to manage traffic in abnormal and emergency situations.~~

TOPIC ABES 1 — ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 1.1 — Overview of ABES				
ADC~~I~~ ~~(TWR)~~ ABES 1.1.1	List common abnormal and emergency situations.	1	Military abnormal and emergency situations (e.g. use of aircraft arresting systems, flame out procedures) *Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure, unreliable instruments, runway incursion, GNSS failure*	ALL
ADC~~I~~ ~~(TWR)~~ ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
ADC~~I~~ ~~(TWR)~~ ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	ICAO Doc 4444, Bird strike, aborted take-off, Military procedures *Optional content: ~~ICAO Doc 4444~~*	~~ADV~~ ADC~~I~~
ADC~~I~~ ~~(TWR)~~ ABES 1.1.4	Take into account that procedures do not exist for all abnormal and emergency situations.	2	*Optional content: real-life examples*	ALL
ADC~~I~~ ~~(TWR)~~ ABES 1.1.5	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				
ADC~~I~~ ~~(TWR)~~ ABES 2.1.1	Ensure effective communication in all circumstances including the case where standard phraseology is not applicable.	4	Phraseology, vocabulary, readback, radio silence instruction	ALL
ADC ABES 2.1.2	Apply change of radiotelephony call sign.	3	ICAO Doc 4444, Regulation (EU) No 923/2012 ~~*Optional content: ICAO Doc 4444*~~	ALL
Subtopic ABES 2.2 — Avoidance of mental overload				
ADC~~I~~ ~~(TWR)~~ ABES 2.2.1	Describe actions to keep the situation under control.	2	*Optional content: sector-splitting, holding, flow management, task delegation*	ALL
ADC~~I~~ ~~(TWR)~~ ABES 2.2.2	Organise priority of actions.	4		ALL

TOPIC ABES 2 — SKILLS IMPROVEMENT				
ADC~~I~~ ~~(TWR)~~ ABES 2.2.3	Ensure the effective circulation of information.	4	*Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR and air defence units, with ground staff, etc.*	ALL
ADC~~I~~ ~~(TWR)~~ ABES 2.2.4	Consider asking for help.	2		ALL
Subtopic ABES 2.3 — Air–ground cooperation				
ADC~~I~~ ~~(TWR)~~ ABES 2.3.1	Collect appropriate information relevant to the situation.	3		ALL
ADC~~I~~ ~~(TWR)~~ ABES 2.3.2	Assist the pilot.	3	Pilot workload *Optional content: instructions, information, support, human factors, etc.*	ALL

TOPIC ABES 3 — PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 3.1 — Application of procedures for ABES				
ADC~~I~~ ~~(TWR)~~ ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	Military abnormal and emergency situations (e.g. use of aircraft arresting systems, flame out procedures) *Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure*	ALL
Subtopic ABES 3.2 — Radio failure				
ADC~~I~~ ~~(TWR)~~ ABES 3.2.1	Describe the procedures to be followed by a pilot when experiencing ~~that pilot experiences~~ complete or partial radio failure.	2	ICAO Doc 4444, Regulation (EU) No 923/2012, military procedures *Optional content: ~~ICAO Doc 4444~~, ~~military procedures~~, simulator operation procedures*	ALL
ADC~~I~~ ~~(TWR)~~ ABES 3.2.2	Apply the procedures to be followed when a pilot experiences complete or partial radio failure.	3	Regulation (EU) No 923/2012, military procedures *Optional content: prolonged loss of communication*	ALL
Subtopic ABES 3.3 — Unlawful interference and aircraft bomb threat				
ADC~~I~~ ~~(TWR)~~ ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3	Regulation (EU) No 923/2012, military procedures *Optional content: simulator operation procedures*	ALL
Subtopic ABES 3.4 — Strayed or unidentified aircraft				
ADC~~I~~ ~~(TWR)~~ ABES 3.4.1	Apply the procedures for~~in the case of~~ strayed aircraft.	3	Regulation (EU) No 923/2012, military procedures *Optional content: inside controlled airspace, outside controlled airspace*	ALL

TOPIC ABES 3 — PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
ADC~~I (TWR)~~ ABES 3.4.2	Apply the procedures for~~in the case of~~ unidentified aircraft.	3	Regulation (EU) No 923/2012, military procedures	ALL
ADC~~I (TWR)~~ ABES 3.4.3	Provide navigational assistance to aircraft.	4	Military procedures *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.*	~~ADV~~ ADC~~I~~
Subtopic ABES 3.5 — Runway incursion				
ADC~~I (TWR)~~ ABES 3.5.1	Apply ATC procedures associated with runway incursion.	3	ICAO Doc 4444, Regulation (EU) 2017/373 ~~*Optional content: ICAO Doc 4444*~~	~~ADV~~ ADC~~I~~
ABES 3.6 — Interception of civil aircraft				
ADC ABES 3.6.1	Explain the procedures in the event of interception of civil aircraft.	2	Military procedures, Regulation (EU) No 923/2012	*ALL*
ABESMIL 3.7 – QRA procedures				
ADC ABESMIL 3.7.1	Apply the procedures in the event of interception of any aircraft.	3	Military procedures	ALL

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				
ADC~~I~~ ~~(TWR)~~ AGA 1.1.1	Define aerodrome data.	1	ICAO Annex 14, Regulation (EU) No 139/2014[9], military publications *Optional content: aerodrome elevation, reference point, apron, movement area, manoeuvring area, hotspot, ~~hot spot~~*	~~ADV~~ ADC~~I~~ APP APS
Subtopic AGA 1.2 — Coordination				
ADC~~I~~ ~~(TWR)~~ AGA 1.2.1	Identify the information that has to be exchanged between ~~Air Traffic Services (~~ATS~~)~~ and the aerodrome authority.	3	Aerodrome conditions, fire/rescue category, condition of ground equipment and NAVAIDs, AIRAC, Regulation (EU) No 139/2014, military publications, ICAO Annex 14	~~ADV~~ ADC~~I~~ APP APS

TOPIC AGA 2 — MOVEMENT AREA				
Subtopic AGA 2.1 — Movement area				
ADC~~I~~ ~~(TWR)~~ AGA 2.1.1	Describe the movement area.	2	ICAO Annex 14, Regulation (EU) No 139/2014, Arming areas	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.1.2	Describe the marking of obstacles and unusable or unserviceable areas.	2	Flags, signs on pavement, lights	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.1.3	Identify the information on conditions of the movement area that has to be passed on to aircraft.	3	Essential information on aerodrome conditions	~~ADV~~ ADC~~I~~ APP APS
Subtopic AGA 2.2 — Manoeuvring area				
ADC~~I~~ ~~(TWR)~~ AGA 2.2.1	Describe the manoeuvring area.	2	ICAO Annex 14, Regulation (EU) No 139/2014 , military publications	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.2.2	Describe the taxiway.	2	Military publications	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.2.3	Describe the daylight marking on taxiways.	2		~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.2.4	Describe taxiway lighting.	2		~~ADV~~ ADC~~I~~ APP APS

[9] Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 44, 14.2.2014, p. 1).

TOPIC AGA 2 — MOVEMENT AREA				
Subtopic AGA 2.3 — Runways				
ADC~~I~~ ~~(TWR)~~ AGA 2.3.1	Describe the runway.	2	Runway, runway surface, runway strip, runway shoulder, runway-end safety areas, clearways, stopways, military marking requirements	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.2	Describe the instrument runway.	2	ICAO Annex 14, Regulation (EU) No 139/2014	ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.3	Describe the non-instrument runway.	2	ICAO Annex 14, Regulation (EU) No 139/2014	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.4	Explain runway declared distances.	2	TORA, TODA, ASDA, LDA	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.5	Explain the differences between ACN and PCN.	2	Strength of pavements	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 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~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.7	Describe runway lights.	2	*Optional content: colour, centre line, intensity, edge, touchdown zone, threshold, barettes*	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.8	Explain the functions of visual landing aids.	2	*Optional content : AVASI, VASI, PAPI*	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.9	Describe the approach lighting systems.	2	Centre line, cross bars, stroboscopic lights, colours, intensity and brightness	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.10	Characterise the effect of water/ice on runways.	2		~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.11	Explain braking ~~action~~ performance and methods of reporting it.	2	~~Braking action coefficient~~	~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 2.3.12	Explain the effect of runway visual range on aerodrome operations.	2		~~ADV~~ ADC~~I~~ APP APS

Subtopic AGAMIL 2.4 — Aircraft arresting systems				
ADC~~I~~ ~~(TWR)~~ AGAMIL 2.4.1	Describe the available aircraft arresting systems and related markings	2		ALL
TOPIC AGA 3 — OBSTACLES				
Subtopic AGA 3.1 — Obstacle-free airspace around aerodromes				
ADC~~I~~ ~~(TWR)~~ AGA 3.1.1	Explain the necessity for establishing and maintaining airspace around aerodromes obstacle free~~an obstacle-free airspace around aerodromes~~.	2		~~ADV~~ ADC~~I~~ APP APS
ADC~~I~~ ~~(TWR)~~ AGA 3.1.2	Explain the necessity for establishing and maintaining protection zones	2	Avoid interferences with navigational systems, PAR	ADC
TOPIC AGA 4 — MISCELLANEOUS EQUIPMENT				
Subtopic AGA 4.1 — Location				
ADC~~I~~ ~~(TWR)~~ AGA 4.1.1	Explain the location of miscellaneous ~~different~~ aerodrome ground equipment.	2	*Optional content: LOC, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI, specific military equipment (e.g. TACAN, GCA Antennas)*	~~ADV~~ ADC~~I~~ APP APS