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	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. 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.

<b>L4 Verb</b>	<b>Definition</b>	<b>Example</b>
<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. 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. 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. 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. 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. 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 5 –  
Aerodrome Control Instrument Rating for Tower ADI (TWR)**

- A. General principles that apply to this AMC are contained in its enclosed Supplement 1.
- 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, topics and sub-topics contained in **Appendix 5 – Aerodrome Control Instrument Rating for Tower ADI (TWR)**.
- C. Subjects, topics and sub-topics from Appendix 5 are repeated in this AMC for the convenience of the reader and do not form part of it.

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## 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) INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
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#### Subtopic INTR 1.2 -Course administration

ADI (TWR) INTR 1.2.1	State course administration.	1		ALL
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#### Subtopic INTR 1.3 -Study material and training documentation

ADI (TWR) INTR 1.3.1	Use appropriate documentation and their sources for course studies.	3	<i>Optional content: Training documentation, library, CBT library, Web, Learning Management Server</i>	ALL
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ADI (TWR) INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation <i>Optional content: supplementary information, library</i>	ALL
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### TOPIC INTR 2 -INTRODUCTION TO THE ATC TRAINING COURSE

#### Subtopic INTR 2.1 -Course content and organisation

ADI (TWR) 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
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ADI (TWR) INTR 2.1.2	State the subjects of the course and their purpose.	1		ALL
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ADI (TWR) INTR 2.1.3	Describe the organisation of theoretical training.	2	<i>Optional content: course programme</i>	ALL
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ADI (TWR) INTR 2.1.4	Describe the organisation of practical training.	2	<i>Optional content: PTP, Simulation, Briefing, Debriefing, course programme</i>	ALL
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#### Subtopic INTR 2.2 -Training ethos

ADI (TWR) INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback	ALL
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#### Subtopic INTR 2.3 -Assessment process

ADI (TWR) INTR 2.3.1	Describe the assessment process.	2		ALL
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**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**

ADI (TWR) LAW 1.1.1	Appreciate the conditions which shall be met to issue an Aerodrome Control Instrument rating with Tower Control endorsement.	3	Commission Regulation (EU) on ATCO Licensing No xxx/yyyy <i>Optional content: National documents</i>	ADI
ADI (TWR) LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
ADI (TWR) LAW 1.1.3	Explain the conditions for suspension/revocation of ATCO licence.	2	Commission Regulation (EU) on ATCO Licensing No xxx/yyyy	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 <i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>	ALL
ADI (TWR) LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, Air traffic incident report <i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>	ALL
ADI (TWR) LAW 2.1.3	Use forms for reporting.	3	Air traffic incident reporting form(s) <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**

ADI (TWR) 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) 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



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

##### Subtopic ATM 1.1 -Aerodrome control service

ADI (TWR) ATM 1.1.1	Appreciate areas of responsibility.	3	Control Zone, Traffic Circuit, Manoeuvring Area, Movement Area, Vicinity <i>Optional content: ATZ</i>	ADV ADI
ADI (TWR) ATM 1.1.2	Provide aerodrome control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals	ADV ADI

##### Subtopic ATM 1.2 -Flight information service (FIS)

ADI (TWR) ATM 1.2.1	Describe the information that shall be passed to aircraft by an aerodrome controller.	2	ICAO Annex 11	ADV ADI
ADI (TWR) ATM 1.2.2	Provide FIS.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ADI (TWR) ATM 1.2.3	Issue appropriate information.	3	ICAO Doc 4444, essential local traffic, traffic information	ADV ADI
ADI (TWR) ATM 1.2.4	Appreciate the use of ATIS for the provision of flight information service by aerodrome controller.	3		ADV ADI

##### Subtopic ATM 1.3 -Alerting service (ALRS)

ADI (TWR) ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ADI (TWR) ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 <i>Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations</i>	ALL

##### Subtopic ATM 1.4 -ATS system capacity and air traffic flow management

ADI (TWR) ATM 1.4.1	Appreciate principles of ATS system capacity and air traffic flow management.	3	<i>Optional content: EUROCONTROL ATFCM Users Manual, Slot management, Slot allocation procedures</i>	ADV ADI
ADI (TWR) ATM 1.4.2	Organise traffic to take account of flow management.	4	<i>Optional content: departure sequence</i>	ADV ADI
ADI (TWR) 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 ADI

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**TOPIC ATM 2 - COMMUNICATION**


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**Subtopic ATM 2.1 - Effective communication**

ADI (TWR) ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 <i>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2</i>	ALL
ADI (TWR) ATM 2.1.2	Ensure effective communication.	4	Communication techniques, Readback/verification of readback	ALL

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**TOPIC ATM 3 - ATC CLEARANCES AND ATC INSTRUCTIONS**
**Subtopic ATM 3.1 - ATC clearances**

ADI (TWR) ATM 3.1.1	Issue appropriate ATC clearances.	3	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ADI (TWR) ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
ADI (TWR) ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL

**Subtopic ATM 3.2 - ATC instructions**

ADI (TWR) ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ADI (TWR) ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
ADI (TWR) ATM 3.2.3	Ensure the agreed course of action is carried out.	4		ALL

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**TOPIC ATM 4 - COORDINATION**
**Subtopic ATM 4.1 - Necessity for coordination**

ADI (TWR) ATM 4.1.1	Identify the need for coordination.	3		ALL
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**Subtopic ATM 4.2 - Tools and methods for coordination**

ADI (TWR) 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
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**Subtopic ATM 4.3 - Coordination procedures**


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ADI (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 <i>Optional content: release point</i>	ALL
ADI (TWR) 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
ADI (TWR) ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
ADI (TWR) ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
ADI (TWR) ATM 4.3.5	Coordinate in the provision of FIS.	4	ICAO Doc 4444	ALL
ADI (TWR) 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) ATM 5.1.1	Allocate levels according to altimetry data.	4	ICAO Doc 8168, ICAO Doc 4444	ALL
ADI (TWR) 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

ADI (TWR) 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
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## TOPIC ATM 6 - SEPARATIONS

### Subtopic ATM 6.1 - Separation between departing aircraft

ADI (TWR) ATM 6.1.1	Provide separation between departing aircraft.	4	ICAO Doc 4444	ADV ADI
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### Subtopic ATM 6.2 - Separation of departing aircraft from arriving aircraft

ADI (TWR) ATM 6.2.1	Provide separation of departing aircraft from arriving aircraft.	4	ICAO Doc 4444	ADI
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### Subtopic ATM 6.3 - Separation of landing aircraft and preceding landing or

ADI (TWR) ATM 6.3.1	Provide separation of landing aircraft and preceding landing or departing aircraft.	4	ICAO Doc 4444	ADV ADI
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### Subtopic ATM 6.4 - Time-based wake turbulence longitudinal separation

ADI (TWR) 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) 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) ATM 7.1.1	Differentiate between ACAS advisory thresholds and aerodrome separation standards.	2	ICAO Doc 9863	ADV ADI
ADI (TWR) ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
ADI (TWR) ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	ACAS, TAWS <i>Optional content: EUROCONTROL ACAS Web page</i>	ADV ADI
<b>Subtopic ATM 7.2 -Ground-based safety nets</b>				
ADI (TWR) ATM 7.2.1	Respond to available ground-based safety nets warnings.	3	<i>Optional content: Anti-incursion</i>	ADV ADI
<b>TOPIC ATM 8 - DATA DISPLAY</b>				
<b>Subtopic ATM 8.1 -Data management</b>				
ADI (TWR) 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) ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
ADI (TWR) ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
ADI (TWR) ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, Supplementary information <i>Optional content: RPL, AFIL, etc.</i>	ALL
ADI (TWR) ATM 8.1.5	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) 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) 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 ADI

<b>Subtopic ATM 9.2 - Verification of the currency of operational procedures</b>				
ADI (TWR) 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) ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
ADI (TWR) 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 10.1 - Responsibility for the provision</b>				
ADI (TWR) ATM 10.1.1	Explain the responsibility for the provision of an aerodrome control service.	2	ICAO Doc 4444, ICAO Annex 11	ADV ADI
ADI (TWR) ATM 10.1.2	Describe the division of responsibility between air traffic control units.	2	ICAO Doc 4444	ALL
ADI (TWR) ATM 10.1.3	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 <i>Optional content: ICAO Doc 9554</i>	ALL
ADI (TWR) ATM 10.1.4	Describe the responsibility in regard to unmanned free balloons.	2	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 10.1.5	Appreciate the influence of operational requirements.	3	<i>Optional content: Military flying, Calibration flights, Aerial photography</i>	ALL
<b>Subtopic ATM 10.2 - Functions of aerodrome control tower</b>				
ADI (TWR) ATM 10.2.1	Manage the general functions of aerodrome control.	4	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 10.2.2	Manage the suspension of VFR operations.	4	ICAO Doc 4444	ADV ADI
<b>Subtopic ATM 10.3 - Traffic management process</b>				
ADI (TWR) ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, observation, traffic projection	ADV ADI
ADI (TWR) ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
ADI (TWR) ATM 10.3.3	Identify potential solutions to achieve a safe and effective flow of aerodrome traffic.	3		ADV ADI
ADI (TWR) ATM 10.3.4	Evaluate possible outcomes of different control actions.	5		ADV ADI
ADI (TWR) ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective flow of aerodrome traffic.	5		ADV ADI

ADI (TWR) ATM 10.3.6	Ensure an adequate priority of actions.	4		ALL
ADI (TWR) ATM 10.3.7	Execute plan in a timely manner.	3		ADV ADI
ADI (TWR) 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 -Aeronautical ground lights</b>				
ADI (TWR) ATM 10.4.1	Select appropriate aeronautical ground lights.	5	ICAO Doc 4444	ADV ADI
<b>Subtopic ATM 10.5 -Information to aircraft by aerodrome control tower</b>				
ADI (TWR) ATM 10.5.1	Provide information related to the operation of aircraft.	4	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 10.5.2	Provide information on aerodrome conditions.	4	ICAO Doc 4444	ADV ADI
<b>Subtopic ATM 10.6 -Control of aerodrome traffic</b>				
ADI (TWR) ATM 10.6.1	Predict positions of aircraft in the aerodrome traffic and taxi circuits.	4	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 10.6.2	Manage traffic on the manoeuvring area.	4	ICAO Doc 4444 Aircraft, vehicles <i>Optional content: runway inspection</i>	ADV ADI
ADI (TWR) ATM 10.6.3	Manage traffic in accordance with procedural changes.	4	<i>Optional content: Taxiway closure</i>	ADV ADI
ADI (TWR) ATM 10.6.4	Balance the workload against personal capacity.	5	<i>Optional content: re-planning, prioritising solutions, denying requests, delaying traffic</i>	ADV ADI
<b>Subtopic ATM 10.7 -Control of traffic in the traffic circuit</b>				
ADI (TWR) ATM 10.7.1	Manage traffic in the traffic circuit.	4	ICAO Doc 4444 Meteorological phenomena, Geographical knowledge, Environmental factors	ADV ADI
ADI (TWR) ATM 10.7.2	Manage arriving and departing traffic.	4	ICAO Doc 4444, Allocation of the order of priority, Meteorological phenomena, Wake turbulence, Environmental factors	ADV ADI
ADI (TWR) ATM 10.7.3	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 ADI
ADI (TWR) ATM 10.7.4	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 ADI
ADI (TWR) ATM 10.7.5	Integrate information about meteorological phenomena into the control of aerodrome traffic.	4	<i>Optional content: Clouds, Precipitation, Visibility, Wind, Meteorological hazards</i>	ADV ADI

ADI (TWR) ATM 10.7.6	Integrate the information provided by situation displays.	4	Use, Advantages, Disadvantages	ADV ADI
ADI (TWR) ATM 10.7.7	Initiate missed approach.	3	Optional content: obstructed runway	ADV ADI
<b>Subtopic ATM 10.8 - Runway in use</b>				
ADI (TWR) ATM 10.8.1	Select the runway in use.	5	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 10.8.2	Coordinate runway in use.	4	Optional content: Approach control, Area control, runway selection, change of runway	ADV ADI
ADI (TWR) ATM 10.8.3	Manage traffic in the event of runway-in-use change.	4		ADV ADI
<b>TOPIC ATM 11 - PROVISION OF AERODROME CONTROL - INSTRUMENT</b>				
<b>Subtopic ATM 11.1 - Low visibility operations and special VFR</b>				
ADI (TWR) ATM 11.1.1	Manage SVFR traffic.	4	ICAO Doc 4444	ADI
ADI (TWR) ATM 11.1.2	Describe the Procedures for Low Visibility Operations.	2	ICAO Doc 4444	ADI
<b>Subtopic ATM 11.2 - Departing traffic</b>				
ADI (TWR) 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) ATM 11.2.2	Integrate departure sequence into the control of aerodrome traffic.	4	ICAO Doc 4444	ADI
ADI (TWR) ATM 11.2.3	Provide appropriate information to departing traffic.	4	ICAO Doc 4444, Use of situation displays, Wake turbulence	ADI
<b>Subtopic ATM 11.3 - Arriving traffic</b>				
ADI (TWR) ATM 11.3.1	Manage control of arriving aircraft.	4	ICAO Doc 4444, Wake turbulence	ADI
ADI (TWR) ATM 11.3.2	Integrate the approach sequence into the control of aerodrome traffic.	4	ICAO Doc 4444	ADI
ADI (TWR) ATM 11.3.3	Integrate aircraft on visual approach into the aerodrome traffic.	4	ICAO Doc 4444	ADI
ADI (TWR) 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) ATM 11.3.5	Integrate aircraft performing circling approach into the aerodrome traffic.	4	ICAO Doc 8168	ADI



ADI (TWR) ATM 11.3.6	Provide appropriate information to arriving aircraft.	4	ICAO Doc 4444	ADI
<b>Subtopic ATM 11.4 -Aerodrome control service with advanced system</b>				
ADI (TWR) ATM 11.4.1	Appreciate the impact of advanced systems on the provision of aerodrome control service.	3	<i>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</i>	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) MET 1.1.1	Appreciate the impact of different cloud types.	3	Cumulus, Cumulonimbus <i>Optional content: Stratus, Nimbostratus, etc.</i>	ADV ADI
ADI (TWR) MET 1.1.2	Appreciate the impact of precipitation.	3	Precipitation and Microphysics <i>Optional content: Rain, Snow, Sleet, Hail</i>	ADV ADI
ADI (TWR) MET 1.1.3	Appreciate the impact of atmospheric obscurity.	3	<i>Optional content: Advection fog, Radiation fog, Mixing, Evaporation, Mist, Drizzle</i>	ADV ADI
ADI (TWR) MET 1.1.4	Appreciate the effect and impact of wind.	3	Gusting, Veering, Backing <i>Optional content: Land breezes, Sea breezes, Föhn</i>	ADV ADI
ADI (TWR) MET 1.1.5	Appreciate the effect and danger of hazardous meteorological phenomena.	3	Wind shear, Turbulence, Thunderstorms, Icing, Microbursts	ADV ADI
ADI (TWR) MET 1.1.6	Appreciate the effect of a frontal system on aerodrome operations.	3		ADV ADI
ADI (TWR) MET 1.1.7	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information <i>Optional content: relevant meteorological phenomena</i>	ALL

**TOPIC MET 2 - SOURCES OF METEOROLOGICAL DATA****Subtopic MET 2.1 - Meteorological instruments**

ADI (TWR) MET 2.1.1	Extract information from meteorological instruments.	3	<i>Optional content: Anemometer, RVR indicator, Cloud base indicator, Ceilometer, Barometer</i>	ADV ADI
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**Subtopic MET 2.2 - Other sources of meteorological data**

ADI (TWR) MET 2.2.1	Decode information from-meteorological data displays.	3		ADV ADI
ADI (TWR) MET 2.2.2	Use appropriate communication tools and networks to obtain meteorological data.	3		ADV ADI
ADI (TWR) MET 2.2.3	Relay meteorological information.	3	ICAO Doc 4444 <i>Optional content: flight information centre, adjacent ATS unit</i>	ADV 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**

ADI (TWR) 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 <i>Optional content: Military maps and charts</i>	ADI
ADI (TWR) NAV 1.1.2	Use relevant maps and charts.	3	Instrument approach charts, SID charts, aerodrome charts, visual approach charts <i>Optional content: Military maps and charts</i>	ADI

**TOPIC NAV 2 - INSTRUMENT NAVIGATION****Subtopic NAV 2.1 - Navigational systems**

ADI (TWR) 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) 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) 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) 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) NAV 2.2.1	Describe the concept of stabilised approach.	2	ICAO Doc 8168, Regulation (EC) No 1899/2006 <i>Optional content: SKYbrary</i>	ADV ADI APP APS
ADI (TWR) NAV 2.2.2	Appreciate the effect of late change of runway-in-use for landing aircraft.	3		ADV ADI

**Subtopic NAV 2.3 - Instrument departures and arrivals**

ADI (TWR) NAV 2.3.1	Characterise SIDs.	2		ADI APP APS
ADI (TWR) NAV 2.3.2	Describe the phases of an instrument approach procedure.	2		ADI
ADI (TWR) NAV 2.3.3	Describe the relevant minima applicable for a precision/ non-precision and visual approach.	2		ADI APP APS

**Subtopic NAV 2.4 -Satellite-based systems**

ADI (TWR) NAV 2.4.1	State the different applications 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
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**Subtopic NAV 2.5 -PBN applications**

ADI (TWR) NAV 2.5.1	State future PBN developments.	1	A-RNP, APV Optional content: RNP 3D, RNP 4D	ADI APP ACP APS ACS
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**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) ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
ADI (TWR) ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	<i>Optional content: Radios (number of), emergency radios</i>	ALL
ADI (TWR) ACFT 1.1.3	Explain the operation of on-board surveillance equipment.	2	Transponders: equipment Mode A, Mode C, Mode S, ADS capability	ADI APP ACS

**TOPIC ACFT 2 -AIRCRAFT CATEGORIES****Subtopic ACFT 2.1 -Wake turbulence**

ADI (TWR) ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to the succeeding aircraft.	2		ALL
ADI (TWR) 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) ACFT 2.2.1	Describe the use of ICAO approach categories.	2	ICAO Doc 8168	ADI APP APS
ADI (TWR) ACFT 2.2.2	Appreciate the effect of ICAO approach categories on the traffic organisation.	3		ADI APP APS

**TOPIC ACFT 3 -FACTORS AFFECTING AIRCRAFT PERFORMANCE****Subtopic ACFT 3.1 -Take-off factors**

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

ADI (TWR) 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 ADI
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**Subtopic ACFT 3.3 -Final approach and landing factors**

ADI (TWR) 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 ADI
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**Subtopic ACFT 3.4 -Economic factors**

ADI (TWR) ACFT 3.4.1	Integrate consideration of economic factors affecting aircraft.	4	<i>Optional content: Starting-up, Taxiing, Routing, Departure sequence</i>	ADV ADI
<b>Subtopic ACFT 3.5 - Environmental factors</b>				
ADI (TWR) ACFT 3.5.1	Appreciate the performance restrictions due to environmental constraints.	3	<i>Optional content: Noise abatement procedures, Minimum flight altitudes, Bird hazard</i>	ADV ADI
<b>TOPIC ACFT 4 - AIRCRAFT DATA</b>				
<b>Subtopic ACFT 4.1 - Recognition of aircraft types</b>				
ADI (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 <i>Optional content: ICAO Approach Categories</i>	ADI
<b>Subtopic ACFT 4.2 - Performance data</b>				
ADI (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 a control service.	4	Performance data under a representative variety of circumstances	ADV ADI

## 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

ADI (TWR) HUM 1.1.1	Describe the human information processing model.	2	Attention, perception, memory, situational awareness, decision making, response	ALL
ADI (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	<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) HUM 2.1.1	State factors that cause fatigue.	1	Shift work <i>Optional content: night shifts and rosters</i>	ALL
ADI (TWR) 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) 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) HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
ADI (TWR) HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		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

### 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	<i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>	ALL
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ADI (TWR) 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) HUM 3.2.1	Identify reasons for conflict.	3		ALL
ADI (TWR) HUM 3.2.2	Describe actions to prevent human conflicts.	2	<i>Optional content: TRM team roles</i>	ALL
ADI (TWR) 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) 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) 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>				
ADI (TWR) 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) 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 situation by offering, asking or accepting assistance.	3	<i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i>	ALL
ADI (TWR) HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, Abnormal situations, 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 used following an incident/accident.	2	<i>Optional content: CISM, Counselling, Human element</i>	ALL
<b>TOPIC HUM 5 -HUMAN ERROR</b>				
<b>Subtopic HUM 5.1 -Human error</b>				



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  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ADI (TWR) HUM 5.1.2	Differentiate between the types of error.	2	Slips, Lapses, Mistakes  <i>Optional content: Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ADI (TWR) 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) 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) HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ADI (TWR) HUM 5.1.6	Execute corrective actions.	3	Error compensation  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ADI (TWR) 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
ADI (TWR) 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>				
ADI (TWR) 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 - COLLABORATIVE WORK</b>				
<b>Subtopic HUM 6.1 - Communication</b>				
ADI (TWR) HUM 6.1.1	Use communication effectively in ATC.	3		ALL
ADI (TWR) HUM 6.1.2	Analyse examples of pilot and controller communication for effectiveness.	4		ALL
<b>Subtopic HUM 6.2 - Collaborative work within the same area of</b>				
ADI (TWR) HUM 6.2.1	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) HUM 6.2.2	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) HUM 6.2.3	List possible actions to provide a safe position handover.	1	<i>Optional content: rigour, preparation, overlap time</i>	ALL
ADI (TWR) HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
<b>Subtopic HUM 6.3 - Collaborative work between different areas of</b>				
ADI (TWR) HUM 6.3.1	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>				
ADI (TWR) HUM 6.4.1	Describe parameters affecting controller/pilot cooperation.	2	<i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>	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) EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, Procedures  <i>Optional content: Frequency selection, Standby equipment</i>	ALL
ADI (TWR) 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) EQPS 1.2.1	Operate landline communications.	3	<i>Optional content: telephone, interphone and intercom equipment</i>	ALL
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### TOPIC EQPS 2 - AUTOMATION IN ATS

#### Subtopic EQPS 2.1 - Aeronautical fixed telecommunication network (AFTN)

ADI (TWR) EQPS 2.1.1	Decode AFTN messages.	3	<i>Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.</i>	ALL
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#### Subtopic EQPS 2.2 - Automatic data interchange

ADI (TWR) EQPS 2.2.1	Use automatic data transfer equipment where available.	3	<i>Optional content: Sequencing systems, Automated information and coordination, OLDI</i>	ADV ADI APS ACS
ADI (TWR) EQPS 2.2.2	Explain operational application of CPDLC for departure clearance (DCL) delivery and D-ATIS.	2	ICAO Doc 9694	ADV ADI

### TOPIC EQPS 3 - CONTROLLER WORKING POSITION

#### Subtopic EQPS 3.1 - Operation and monitoring of equipment

ADI (TWR) EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, Responsibilities	ALL
ADI (TWR) 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, UDF/VDF</i>	ALL
ADI (TWR) EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL

#### Subtopic EQPS 3.2 - Situation displays and information systems

ADI (TWR) EQPS 3.2.1	Use situation displays.	3		ALL
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ADI (TWR) EQPS 3.2.2	Check availability of information material.	3		ALL
ADI (TWR) EQPS 3.2.3	Obtain information from equipment.	3	<i>Optional content: information from wind direction indicator</i>	ADV ADI
ADI (TWR) EQPS 3.2.4	Take account of anti-incursion equipment.	2		ADI
ADI (TWR) EQPS 3.2.5	Explain the use of ASMGCS.	2		ADI
<b>Subtopic EQPS 3.3 -Flight data systems</b>				
ADI (TWR) 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) 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) EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
ADI (TWR) 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) EQPS 5.2.1	Identify that communication equipment has degraded.	3	<i>Optional content: Ground-air, ground-ground and landline communications</i>	ADV ADI
ADI (TWR) 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 ADI
<b>Subtopic EQPS 5.3 -Navigational equipment degradation</b>				
ADI (TWR) 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) EQPS 5.3.2	Apply 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 APP ACP APS 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****Subtopic PEN 1.1 - Study visit to aerodrome**

ADI (TWR) PEN 1.1.1	Appreciate the functions and provision of an operational aerodrome control service.	3	study visit to TWR	ADV ADI
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**TOPIC PEN 2 - AIRSPACE USERS****Subtopic PEN 2.1 - Contributors to civil ATS operations**

ADI (TWR) PEN 2.1.1	Characterise civil ATS activities at aerodrome.	2	study visit to TWR <i>Optional content: familiarisation visits to APP, ACC, AIS, RCC</i>	ADV ADI
ADI (TWR) PEN 2.1.2	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**

ADI (TWR) PEN 2.2.1	Characterise military ATS activities.	2	<i>Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units</i>	ALL
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**TOPIC PEN 3 - CUSTOMER RELATIONS****Subtopic PEN 3.1 - Provision of services and user requirements**

ADI (TWR) PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
ADI (TWR) PEN 3.1.2	Appreciate ATS users requirements.	3		ALL

**TOPIC PEN 4 - ENVIRONMENTAL PROTECTION****Subtopic PEN 4.1 - Environmental protection**

ADI (TWR) PEN 4.1.1	Describe the environmental constraints on aerodrome operations.	2	<i>Optional content: CAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions</i>	ADV ADI APP APS
ADI (TWR) PEN 4.1.2	Explain the use of Collaborative Environmental Management (CEM) process at airports.	2		ADV ADI APP APS
ADI (TWR) PEN 4.1.3	Appreciate the mitigation techniques used at aerodromes to minimise aviation's impact on the environment.	3	<i>Optional content: Noise abatement procedures, flight efficiency</i>	ADV ADI

## Subject 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in abnormal and emergency situations.

### TOPIC ABES 1 - ABNORMAL AND EMERGENCY SITUATIONS (ABES)

#### Subtopic ABES 1.1 - Overview of ABES

ADI (TWR) ABES 1.1.1	List common abnormal and emergency situations.	1	<i>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</i>	ALL
ADI (TWR) ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
ADI (TWR) ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	Bird strike, aborted take-off <i>Optional content: ICAO Doc 4444</i>	ADV ADI
ADI (TWR) ABES 1.1.4	Take into account that procedures don't exist for all abnormal and emergency situations.	2	<i>Optional content: real life examples</i>	ALL
ADI (TWR) ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	<i>Optional content: Separation, Information, Coordination</i>	ALL

### TOPIC ABES 2 - SKILLS IMPROVEMENT

#### Subtopic ABES 2.1 - Communication effectiveness

ADI (TWR) 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) 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) ABES 2.2.1	Describe actions to keep the control of the situation.	2	<i>Optional content: sector splitting, holding, flow management, task delegation</i>	ALL
ADI (TWR) ABES 2.2.2	Organise priority of actions.	4		ALL
ADI (TWR) 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) ABES 2.2.4	Consider asking for help.	2		ALL

#### Subtopic ABES 2.3 - Air / ground cooperation

ADI (TWR) ABES 2.3.1	Collect appropriate information relevant for the situation.	3		ALL
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ADI (TWR) ABES 2.3.2	Assist the pilot.	3	Pilot workload <i>Optional content: Instructions, information, support, human factors, etc.</i>	ALL
<b>TOPIC ABES 3 - PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS</b>				
<b>Subtopic ABES 3.1 - Application of procedures for ABES</b>				
ADI (TWR) ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	<i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground based safety nets alerts, airframe failure</i>	ALL
<b>Subtopic ABES 3.2 - Radio failure</b>				
ADI (TWR) ABES 3.2.1	Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure.	2	ICAO Doc 7030 <i>Optional content: military procedures</i>	ALL
ADI (TWR) 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) ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3	ICAO Doc 4444	ALL
<b>Subtopic ABES 3.4 - Strayed or unidentified aircraft</b>				
ADI (TWR) ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	ICAO Doc 4444 <i>Optional content: Inside controlled airspace, Outside controlled airspace</i>	ALL
ADI (TWR) ABES 3.4.2	Apply the procedures in the case of unidentified aircraft.	3	ICAO Doc 4444	ALL
ADI (TWR) 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 ADI
<b>Subtopic ABES 3.5 - Runway incursion</b>				
ADI (TWR) ABES 3.5.1	Apply ATC procedures associated with runway incursion.	3	ICAO Doc 4444	ADV 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) AGA 1.1.1	Define aerodrome data.	1	ICAO Annex 14 <i>Optional content: Aerodrome elevation, Reference point, Apron, Movement area, Manoeuvring area, Hot spot</i>	ADV ADI APP APS
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**Subtopic AGA 1.2 - Coordination**

ADI (TWR) 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 ADI APS ADI
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**TOPIC AGA 2 - MOVEMENT AREA****Subtopic AGA 2.1 - Movement area**

ADI (TWR) AGA 2.1.1	Describe movement area.	2	ICAO Annex 14	ADV ADI APP APS
ADI (TWR) AGA 2.1.2	Describe the marking of obstacles and unusable or unserviceable areas.	2	Flags, Signs on pavement, Lights	ADV ADI APP APS
ADI (TWR) 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 ADI APP APS

**Subtopic AGA 2.2 - Manoeuvring area**

ADI (TWR) AGA 2.2.1	Describe manoeuvring area.	2	ICAO Annex 14	ADV ADI APP APS
ADI (TWR) AGA 2.2.2	Describe taxiway.	2		ADV ADI APP APS
ADI (TWR) AGA 2.2.3	Describe the daylight marking on taxiways.	2		ADV ADI APP APS
ADI (TWR) AGA 2.2.4	Describe taxiway lighting.	2		ADV ADI APP APS

**Subtopic AGA 2.3 - Runways**

ADI (TWR) AGA 2.3.1	Describe runway.	2	Runway, Runway surface, Runway strip, Shoulder, Runway end safety areas, Clearways, Stopways	ADV ADI APP APS
ADI (TWR) AGA 2.3.2	Describe instrument runway.	2	ICAO Annex 14	ADI APP APS



ADI (TWR) AGA 2.3.3	Describe non-instrument runway.	2	ICAO Annex 14	ADV ADI APP APS
ADI (TWR) AGA 2.3.4	Explain declared distances.	2	TORA, TODA, ASDA, LDA	ADV ADI APP APS
ADI (TWR) AGA 2.3.5	Explain the differences between ACN and PCN.	2	Strength of pavements	ADV ADI APP APS
ADI (TWR) 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 ADI APP APS
ADI (TWR) AGA 2.3.7	Describe runway lights.	2	<i>Optional content: Colour, Centre line, Intensity, Edge, Touchdown zone, Threshold, Barettes</i>	ADV ADI APP APS
ADI (TWR) AGA 2.3.8	Explain the functions of visual landing aids.	2	<i>Optional content: AVASI, VASI, PAPI</i>	ADV ADI APP APS
ADI (TWR) AGA 2.3.9	Describe the approach lighting systems.	2	Centre line, cross bars, Stroboscopic lights, Colours, Intensity and brightness	ADV ADI APP APS
ADI (TWR) AGA 2.3.10	Characterise the effect of water/ice on runways.	2		ADV ADI APP APS
ADI (TWR) AGA 2.3.11	Explain braking action.	2	Braking action coefficient	ADV ADI APP APS
ADI (TWR) AGA 2.3.12	Explain the effect of runway visual range on aerodrome operation	2		ADV ADI APP APS

### TOPIC AGA 3 - OBSTACLES

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

ADI (TWR) AGA 3.1.1	Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes.	2		ADV ADI APP APS
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### TOPIC AGA 4 - MISCELLANEOUS EQUIPMENT

#### Subtopic AGA 4.1 - Location

ADI (TWR) 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 ADI APP APS
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**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 related subject objective.
  - iii. Subjects, topics and sub-topics are contained in Appendix 5 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(ii) Aerodrome Control Instrument Rating for Tower — ADI (TWR)), and are repeated in this AMC to provide the reader with a comprehensive and unique reference document. Subject objectives and training objectives are included in and form integral part of this AMC.

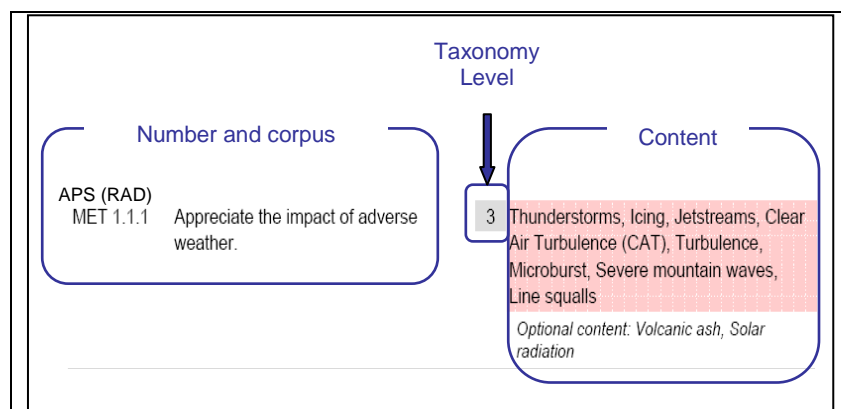
<b>Subject 4 : METEOROLOGY</b>			<b>Subject</b>
<b>TOPIC MET 1 METEOROLOGICAL PHENOMENA</b>			<b>Topic</b>
<b>Sub-topic MET 1.1 - Meteorological phenomena</b>			<b>Sub-topic</b>
ACS (RAD) MET 1.1.1	Appreciate the impact of adverse weather.	3	Thunderstorms, Icing, Jetstreams, Clear Air Turbulence (CAT), Turbulence, Microburst, Severe mountain waves, Line squalls <i>Optional content: Volcanic ash, Solar radiation</i>
ACS (RAD) MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	<i>Optional content: Separation, holding, diversions, re-routings, etc</i>
ACS (RAD) MET 1.1.3	Integrate data about meteorological phenomena into clearances, instructions and transmitted information.	4	<i>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</i>

**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 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 APS
APS MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information <i>Optional content: relevant meteorological phenomena</i>	ALL
APS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS 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 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 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	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. 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 Calculate conversions between the three north designations.
<b>Check</b>	Make sure the information is correct (satisfactory)	Check the accuracy of flight data information Check availability of information material.
<b>Choose</b>	Select out of number, decide to do one thing rather than another	Choose appropriate levels. 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



<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
		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. 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. 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 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 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. Respond to distress and urgency messages and signals.
<b>Scan</b>	Continuously observe rapidly, sequentially and selectively in order to	Scan data display

<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
	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. 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.

<b>L4 Verb</b>	<b>Definition</b>	<b>Example</b>
<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. 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. 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. 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. 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. 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.
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## 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

































































## 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 related subject objective.
  - iii. Subjects, topics and sub-topics are contained in Appendix 6 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(iii) Approach Control Procedural Rating — APP), and are repeated in this AMC to provide the reader with a comprehensive and unique reference document. Subject objectives and training objectives are included in and form integral part of this AMC.

<b>Subject 4 : METEOROLOGY</b> ← <b>Subject</b>		
<b>TOPIC MET 1 METEOROLOGICAL PHENOMENA</b> ← <b>Topic</b>		
<b>Sub-topic MET 1.1 - Meteorological phenomena</b> ← <b>Sub -topic</b>		
ACS (RAD) MET 1.1.1	Appreciate the impact of adverse weather.	3 Thunderstorms, Icing, Jetstreams, Clear Air Turbulence (CAT), Turbulence, Microburst, Severe mountain waves, Line squalls <i>Optional content: Volcanic ash, Solar radiation</i>
ACS (RAD) MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4 <i>Optional content: Separation, holding, diversions, re-routings, etc</i>
ACS (RAD) MET 1.1.3	Integrate data about meteorological phenomena into clearances, instructions and transmitted information.	4 <i>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</i>

**Figure 1: Layout of syllabus**

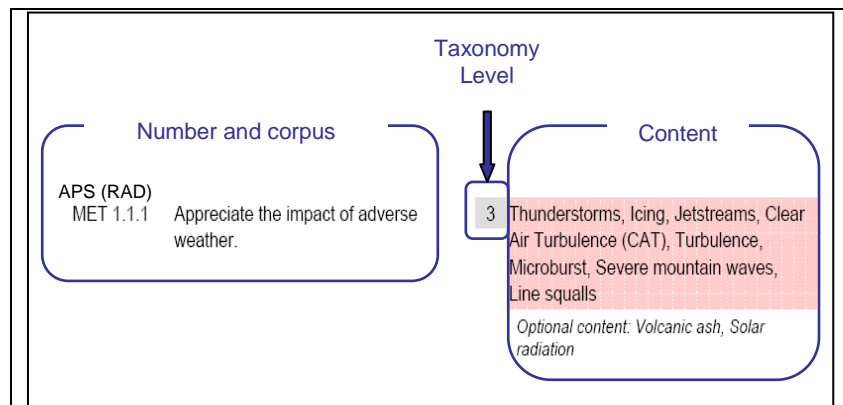
- b. The following principles may be applied to the development of a training course that is based on any of the syllabi:
  - i. The structure of the syllabi and the order of the objectives contained within Appendix 6 to Regulation (EU) No .../... is neither intended to convey a pedagogical sequence 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 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 APS
APS MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information <i>Optional content: relevant meteorological phenomena</i>	ALL
APS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS 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 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 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	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. 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 Calculate conversions between the three north designations.
<b>Check</b>	Make sure the information is correct (satisfactory)	Check the accuracy of flight data information Check availability of information material.
<b>Choose</b>	Select out of number, decide to do one thing rather than another	Choose appropriate levels. 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

<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
		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. 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. 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 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 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. Respond to distress and urgency messages and signals.
<b>Scan</b>	Continuously observe rapidly, sequentially and selectively in order to	Scan data display

<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
	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. 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.

<b>L4 Verb</b>	<b>Definition</b>	<b>Example</b>
<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. 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. 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. 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. 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. 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
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- 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.
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CDR	Conditional Route
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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
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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 its enclosed Supplement 1.
- B. ATCO Rating training Area Control Procedural Rating (ACP) should contain the following subject objectives and training objectives that are associated with the subjects, topics and sub-topics contained in **Appendix 7 – Area Control Procedural Rating (ACP)**.
- C. Subjects, topics and sub-topics from Appendix 7 are repeated in this AMC for the convenience of the reader and do not form part of it.



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## 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 INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
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#### Subtopic INTR 1.2 -Course administration

ACP INTR 1.2.1	State course administration.	1		ALL
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#### Subtopic INTR 1.3 -Study material and training documentation

ACP INTR 1.3.1	Use appropriate documentation and their sources for course studies.	3	<i>Optional content: Training documentation, library, CBT library, Web, Learning Management Server</i>	ALL
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ACP INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation <i>Optional content: supplementary information, library</i>	ALL
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### TOPIC INTR 2 - INTRODUCTION TO THE ATC TRAINING COURSE

#### Subtopic INTR 2.1 -Course content and organisation

ACP 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
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ACP INTR 2.1.2	State the subjects of the course and their purpose.	1		ALL
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ACP INTR 2.1.3	Describe the organisation of theoretical training.	2	<i>Optional content: course programme</i>	ALL
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ACP INTR 2.1.4	Describe the organisation of practical training.	2	<i>Optional content: PTP, Simulation, Briefing, Debriefing, course programme</i>	ALL
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#### Subtopic INTR 2.2 -Training ethos

ACP INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback	ALL
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#### Subtopic INTR 2.3 -Assessment process

ACP INTR 2.3.1	Describe the assessment process.	2		ALL
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**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 LAW 1.1.1	Appreciate the conditions which shall be met to issue an Area Control Procedural rating.	3	Commission Regulation (EU) on ATCO Licensing No xxx/yyyy <i>Optional content: National documents</i>	ACP
ACP LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
ACP LAW 1.1.3	Explain the conditions for suspension/revocation of ATCO licence.	2	Commission Regulation (EU) on ATCO Licensing No xxx/yyyy	ALL

**TOPIC LAW 2 - RULES AND REGULATIONS****Subtopic LAW 2.1 -Reports**

ACP LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report <i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>	ALL
ACP LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, Air traffic incident report <i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>	ALL
ACP LAW 2.1.3	Use forms for reporting.	3	Air traffic incident reporting form(s) <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 LAW 2.2.1	Appreciate classes and structure of airspace and their relevance to Area Control Procedural rating operations.	3		ACP
ACP 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 LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL
<b>TOPIC LAW 3 - ATC SAFETY MANAGEMENT</b>				
<b>Subtopic LAW 3.1 - Feedback process</b>				
ACP LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	<i>Optional content: voluntary reporting</i>	ALL
ACP LAW 3.1.2	Describe how reported occurrences are analysed.	2	<i>Optional content: ESARR 2, local procedures</i>	ALL
ACP LAW 3.1.3	Name the means used to disseminate recommendations.	1	<i>Optional content: Safety letters, safety boards web pages</i>	ALL
ACP LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	<b>Benefits, prerequisites, constraints</b> <i>Optional content: EAM 2 GUI 6, GAIN Report</i>	ALL
<b>Subtopic LAW 3.2 - Safety Investigation</b>				
ACP LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
ACP LAW 3.2.2	Define working methods of Safety Investigation.	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

##### Subtopic ATM 1.1 -Air traffic control (ATC) service

ACP ATM 1.1.1	Appreciate own area of responsibility.	3		APP ACP APS ACS
ACP ATM 1.1.2	Provide area control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals	ACP ACS

##### Subtopic ATM 1.2 -Flight information service (FIS)

ACP ATM 1.2.1	Provide FIS.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ACP ATM 1.2.2	Issue appropriate information concerning the location of conflicting traffic.	3	ICAO Doc 4444, Traffic information, Essential traffic information	APP ACP APS ACS

##### Subtopic ATM 1.3 -Alerting service (ALRS)

ACP ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ACP ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 <i>Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations</i>	ALL

##### Subtopic ATM 1.4 -ATS system capacity and air traffic flow management

ACP ATM 1.4.1	Appreciate principles of ATS system capacity and air traffic flow management.	3	<i>Optional content: EUROCONTROL ATFCM Users Manual, FABs, FUA, free flight, etc.</i>	APP ACP APS ACS
ACP ATM 1.4.2	Apply flow management procedures in the provision of ATC.	3	<i>Optional content: EUROCONTROL ATFCM Users Manual</i>	APP ACP APS ACS
ACP 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 ACP APS ACS
ACP 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 ACP APS ACS

ACP 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 ACP APS ACS
<b>Subtopic ATM 1.5 - Airspace management (ASM)</b>				
ACP 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 ACP APS ACS
ACP 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 ACP
<b>TOPIC ATM 2 - COMMUNICATION</b>				
<b>Subtopic ATM 2.1 - Effective communication</b>				
ACP ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 <i>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2</i>	ALL
ACP ATM 2.1.2	Ensure effective communication.	4	Communication techniques, Readback/verification of readback	ALL
<b>TOPIC ATM 3 - ATC CLEARANCES AND ATC INSTRUCTIONS</b>				
<b>Subtopic ATM 3.1 - ATC clearances</b>				
ACP ATM 3.1.1	Issue appropriate ATC clearances.	3	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ACP ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
ACP ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL
<b>Subtopic ATM 3.2 - ATC instructions</b>				
ACP ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ACP ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
ACP 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

ACP ATM 4.1.1	Identify the need for coordination.	3		ALL
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### Subtopic ATM 4.2 - Tools and methods for coordination

ACP 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
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### Subtopic ATM 4.3 - Coordination procedures

ACP 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 <i>Optional content: release point</i>	ALL
ACP 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 ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
ACP ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
ACP ATM 4.3.5	Coordinate in the provision of FIS.	4	ICAO Doc 4444	ALL
ACP 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 ATM 5.1.1	Allocate levels according to altimetry data.	4	ICAO Doc 8168, ICAO Doc 4444	ALL
ACP 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

ACP 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 ACP
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## TOPIC ATM 6 - SEPARATIONS

### Subtopic ATM 6.1 - Vertical separation

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

### Subtopic ATM 6.2 - Horizontal separation

ACP ATM 6.2.1	Provide longitudinal separation.	4	Based on time, Based on distance (DME and/or GNSS, RNAV) <i>Optional content: Based on time with Mach number technique</i>	ACP
ACP ATM 6.2.2	Provide lateral separation.	4	ICAO Doc 4444, ICAO Doc 7030, holding	APP ACP
ACP ATM 6.2.3	Provide track separation.	4		ACP APP
ACP ATM 6.2.4	Provide geographical separation.	4	Visual, Using navigation aids, Area Navigation	ACP APP

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

### Subtopic ATM 7.1 - Airborne collision avoidance systems

ACP ATM 7.1.1	Differentiate between ACAS advisory thresholds and separation standards applicable in the area control environment.	2	ICAO Doc 9863 <i>Optional content: EUROCONTROL TCAS Web page</i>	ACP ACS
ACP ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
ACP ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	ACAS, TAWS <i>Optional content: EUROCONTROL TCAS Web page</i>	APP ACP APS ACS

## TOPIC ATM 8 - DATA DISPLAY

### Subtopic ATM 8.1 - Data management

ACP 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
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ACP ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
ACP ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
ACP ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, Supplementary information <i>Optional content: RPL, AFIL, etc.</i>	ALL
ACP 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

ACP ATM 9.1.1	Obtain information concerning the operational environment.	3	<i>Optional content: Briefing, notices, local orders, verification of information</i>	ALL
ACP 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 ACP APS ACS

### Subtopic ATM 9.2 - Verification of the currency of operational procedures

ACP ATM 9.2.1	Check all relevant documentation before managing traffic.	3	<i>Optional content: Briefing, LOAs, NOTAM, AICs</i>	ALL
ACP ATM 9.2.2	Manage traffic in accordance with procedural changes.	4		APP ACP APS ACS

### Subtopic ATM 9.3 - Handover-takeover

ACP ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
ACP 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

ACP ATM 10.1.1	Describe the division of responsibility between air traffic control units.	2	ICAO Doc 4444	ALL
ACP ATM 10.1.2	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 <i>Optional content: ICAO Doc 9554</i>	ALL
ACP ATM 10.1.3	Describe the responsibility in regard to unmanned free balloons.	2	ICAO Doc 4444	APP ACP APS ACS
ACP ATM 10.1.4	Obtain operational information.	3	ICAO Doc 4444, Local operation manuals	APP ACP APS ACS
ACP ATM 10.1.5	Interpret operational information.	5		APP ACP APS ACS

ACP ATM 10.1.6	Organise forwarding of operational information.	4	<i>Optional content: including the use of backup procedures</i>	APP ACP APS ACS
ACP ATM 10.1.7	Integrate operational information into control decisions.	4		APP ACP APS ACS
ACP ATM 10.1.8	Appreciate the influence of operational requirements.	3	<i>Optional content: Military flying, Calibration flights, Aerial photography</i>	ALL
<b>Subtopic ATM 10.2 -Area control</b>				
ACP 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 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 ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, traffic projection	APP ACP
ACP ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
ACP ATM 10.3.3	Identify potential solutions to achieve a safe and effective traffic flow.	3		APP ACP APS ACS
ACP ATM 10.3.4	Evaluate possible outcomes of different planning and control actions.	5		APP ACP APS ACS
ACP ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective traffic flow.	5		APP ACP APS ACS
ACP ATM 10.3.6	Ensure an adequate priority of actions.	4		ALL
ACP ATM 10.3.7	Execute selected plan in a timely manner.	3		APP ACP APS ACS
ACP 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 ATM 10.4.1	Manage arrivals, departures and overflights.	4		APP ACP APS ACS
ACP ATM 10.4.2	Balance the workload against personal capacity.	5	<i>Optional content: re-routing, re-planning, prioritising solutions, denying requests, delegating responsibility for separation</i>	APP ACP APS ACS
<b>TOPIC ATM 11 -HOLDING</b>				
<b>Subtopic ATM 11.1 -General holding procedures</b>				

ACP ATM 11.1.1	Apply holding procedures.	3	ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times	APP ACP APS ACS
ACP ATM 11.1.2	Appreciate the factors affecting holding patterns.	3	effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type	APP ACP APS ACS
<b>Subtopic ATM 11.2 -Holding aircraft</b>				
ACP ATM 11.2.1	Calculate expected onward clearance times.	3		ACP 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**

ACP 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, Volcanic ash  <i>Optional content: Solar radiation</i>	ACP ACS
ACP MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information  <i>Optional content: relevant meteorological phenomena</i>	ALL
ACP MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS ACS

**TOPIC MET 2 - SOURCES OF METEOROLOGICAL DATA****Subtopic MET 2.1 - Sources of meteorological information**

ACP MET 2.1.1	Obtain meteorological information	3	METAR, TAF, SIGMET, AIRMET  <i>Optional content: AIREP/AIREP Special</i>	APP ACP APS ACS
ACP MET 2.1.2	Relay meteorological information.	3	ICAO Doc 4444  <i>Optional content: flight information centre, adjacent ATS unit</i>	APP ACP APS 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 NAV 1.1.1	Use relevant maps and charts.	3		APP ACP APS ACS
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**TOPIC NAV 2 - INSTRUMENT NAVIGATION****Subtopic NAV 2.1 - Navigational systems**

ACP NAV 2.1.1	Manage traffic in case of change in the operational status of navigational systems.	4	<i>Optional content: limitations, status of ground-based and satellite-based systems</i>	APP ACP APS ACS
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ACP NAV 2.1.2	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
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**Subtopic NAV 2.2 - Navigational assistance**

ACP NAV 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 ACP APS ACS
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**Subtopic NAV 2.3 - PBN applications**

ACP NAV 2.3.1	State the navigation applications used in terminal and en-route environments.	1	Terminal-RNAV-1 ( $\approx$ P-RNAV); En-route-RNAV-5 (B-RNAV) <i>Optional content: A-RNP, EC PBN Implementing Rule, ICAO Doc 9613</i>	ACP ACS
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ACP NAV 2.3.2	Explain the principles and designation of navigation specifications in use.	2	<i>Optional content: performance, functionality, sensors, aircrew and controller requirements</i>	APP ACP APS ACS
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ACP NAV 2.3.3	State future PBN developments.	1	A-RNP, APV <i>Optional content: RNP 3D, RNP 4D</i>	ADI APP ACP APS ACS
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**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 ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
ACP ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	<i>Optional content: Radios (number of), emergency radios</i>	ALL

**TOPIC ACFT 2 - AIRCRAFT CATEGORIES****Subtopic ACFT 2.1 - Wake turbulence**

ACP ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to the succeeding aircraft.	2		ALL
ACP 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 ACFT 3.1.1	Integrate the influence of factors affecting aircraft during climb.	4	<i>Optional content: speed, mass, air density, cabin pressurisation, wind and temperature</i>	APP ACP APS ACS
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**Subtopic ACFT 3.2 - Cruise factors**

ACP ACFT 3.2.1	Integrate the influence of factors affecting aircraft during cruise.	4	Level, cruising speed, wind, mass, cabin pressurisation	APP ACP APS ACS
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**Subtopic ACFT 3.3 - Descent factors**

ACP ACFT 3.3.1	Integrate the influence of factors affecting aircraft during descent.	4	<i>Optional content: wind, speed, rate of descent, cabin pressurisation</i>	ACP ACS
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**Subtopic ACFT 3.4 - Economic factors**

ACP 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 ACS
ACP ACFT 3.4.2	Use continuous climb techniques where applicable.	3		APP ACP APS ACS
ACP ACFT 3.4.3	Use direct routing where applicable.	3		APP ACP APS ACS

**Subtopic ACFT 3.5 - Environmental factors**

ACP 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 ACS
<b>TOPIC ACFT 4 - AIRCRAFT DATA</b>				
<b>Subtopic ACFT 4.1 - Performance data</b>				
ACP 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 ACP APS 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 HUM 1.1.1	Describe the human information processing model.	2	Attention, perception, memory, situational awareness, decision making, response	ALL
ACP 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 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 HUM 2.1.1	State factors that cause fatigue.	1	Shift work <i>Optional content: night shifts and rosters</i>	ALL
ACP 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 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 HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
ACP HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL

**Subtopic HUM 2.2 - Fitness**

ACP HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
ACP 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)**

ACP HUM 3.1.1	State the relevance of TRM.	1	<i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>	ALL
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ACP 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>				
ACP HUM 3.2.1	Identify reasons for conflict.	3		ALL
ACP HUM 3.2.2	Describe actions to prevent human conflicts.	2	<i>Optional content: TRM team roles</i>	ALL
ACP 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>				
ACP 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 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>				
ACP 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>				
ACP 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 HUM 4.2.2	Respond to stressful situation by offering, asking or accepting assistance.	3	<i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i>	ALL
ACP HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, Abnormal situations, CISM	ALL
ACP HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
ACP HUM 4.2.5	Explain procedures used following an incident/accident.	2	<i>Optional content: CISM, Counselling, Human element</i>	ALL
<b>TOPIC HUM 5 -HUMAN ERROR</b>				
<b>Subtopic HUM 5.1 -Human error</b>				

ACP 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  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ACP HUM 5.1.2	Differentiate between the types of error.	2	Slips, Lapses, Mistakes  <i>Optional content: Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ACP 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 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 HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ACP HUM 5.1.6	Execute corrective actions.	3	Error compensation  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ACP 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 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>				
ACP 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 - COLLABORATIVE WORK</b>				
<b>Subtopic HUM 6.1 - Communication</b>				
ACP HUM 6.1.1	Use communication effectively in ATC.	3		ALL
ACP HUM 6.1.2	Analyse examples of pilot and controller communication for effectiveness.	4		ALL
<b>Subtopic HUM 6.2 - Collaborative work within the same area of</b>				

ACP HUM 6.2.1	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 HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	<i>Optional content: Strips legibility and encoding, labels designation, Feedback</i>	ALL
ACP HUM 6.2.3	List possible actions to provide a safe position handover.	1	<i>Optional content: rigour, preparation, overlap time</i>	ALL
ACP HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
<b>Subtopic HUM 6.3 - Collaborative work between different areas of</b>				
ACP HUM 6.3.1	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>				
ACP HUM 6.4.1	Describe parameters affecting controller/pilot cooperation.	2	<i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>	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

ACP EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, Procedures <i>Optional content: Frequency selection, Standby equipment</i>	ALL
ACP 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 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 ACP APS ACS

#### Subtopic EQPS 1.2 - Other voice communications

ACP EQPS 1.2.1	Operate landline communications.	3	<i>Optional content: telephone, interphone and intercom equipment</i>	ALL
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### TOPIC EQPS 2 - AUTOMATION IN ATS

#### Subtopic EQPS 2.1 - Aeronautical fixed telecommunication network (AFTN)

ACP EQPS 2.1.1	Decode AFTN messages.	3	<i>Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.</i>	ALL
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#### Subtopic EQPS 2.2 - Automatic data interchange

ACP EQPS 2.2.1	Use automatic data transfer equipment where available.	3	<i>Optional content: Automated information and coordination, OLDI</i>	APP ACP
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### TOPIC EQPS 3 - CONTROLLER WORKING POSITION

#### Subtopic EQPS 3.1 - Operation and monitoring of equipment

ACP EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, Responsibilities	ALL
ACP 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, UDF/VDF</i>	ALL
ACP EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL

#### Subtopic EQPS 3.2 - Situation displays and information systems

ACP EQPS 3.2.1	Use situation displays.	3		ALL
ACP EQPS 3.2.2	Check availability of information material.	3		ALL
ACP EQPS 3.2.3	Obtain information from equipment.	3		APP ACP APS ACS
<b>Subtopic EQPS 3.3 -Flight data systems</b>				
ACP 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 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 EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
ACP 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 EQPS 5.2.1	Identify that communication equipment has degraded.	3	<i>Optional content: Ground-air and landline communications</i>	APP ACP APS ACS
ACP EQPS 5.2.2	Apply 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 ACP APS ACS
<b>Subtopic EQPS 5.3 -Navigational equipment degradation</b>				
ACP EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	<i>Optional content: VOR, Navigational aids</i>	ALL
ACP EQPS 5.3.2	Apply 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 APP ACP APS 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****Subtopic PEN 1.1 - Study visit to area control centre**

ACP PEN 1.1.1	Appreciate the functions and provision of an operational area control service.	3	study visit to area control centre	ACP ACS
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**TOPIC PEN 2 - AIRSPACE USERS****Subtopic PEN 2.1 - Contributors to civil ATS operations**

ACP PEN 2.1.1	Characterise civil ATS activities in area control centre.	2	Study visit to an area control centre <i>Optional content: familiarisation visits to TWR, APP, AIS, RCC</i>	ACP ACS
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ACP PEN 2.1.2	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
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**Subtopic PEN 2.2 - Contributors to military ATS operations**

ACP PEN 2.2.1	Characterise military ATS activities.	2	<i>Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units</i>	ALL
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**TOPIC PEN 3 - CUSTOMER RELATIONS****Subtopic PEN 3.1 - Provision of services and user requirements**

ACP PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
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ACP PEN 3.1.2	Appreciate ATS users requirements.	3		ALL
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**TOPIC PEN 4 - ENVIRONMENTAL PROTECTION****Subtopic PEN 4.1 - Environmental protection**

ACP PEN 4.1.1	Appreciate the mitigation techniques used en-route to minimise the aviation's impact on the environment.	3	<i>Optional content: FRA, night/weekend routes, ICAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions</i>	ACP ACS
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## Subject 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in abnormal and emergency situations.

### TOPIC ABES 1 - ABNORMAL AND EMERGENCY SITUATIONS (ABES)

#### Subtopic ABES 1.1 - Overview of ABES

ACP ABES 1.1.1	List common abnormal and emergency situations.	1	<i>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</i>	ALL
ACP ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
ACP ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	<i>Optional content: ICAO Doc 4444</i>	APP ACP APS ACS
ACP ABES 1.1.4	Take into account that procedures don't exist for all abnormal and emergency situations.	2	<i>Optional content: real life examples</i>	ALL
ACP ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	<i>Optional content: Separation, Information, Coordination</i>	ALL

### TOPIC ABES 2 - SKILLS IMPROVEMENT

#### Subtopic ABES 2.1 - Communication effectiveness

ACP 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 ABES 2.1.2	Apply change of radiotelephony call sign.	3	ICAO Doc 4444	ALL

#### Subtopic ABES 2.2 - Avoidance of mental overload

ACP ABES 2.2.1	Describe actions to keep the control of the situation.	2	<i>Optional content: sector splitting, holding, flow management, task delegation</i>	ALL
ACP ABES 2.2.2	Organise priority of actions.	4		ALL
ACP 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 ABES 2.2.4	Consider asking for help.	2		ALL

#### Subtopic ABES 2.3 - Air / ground cooperation

ACP ABES 2.3.1	Collect appropriate information relevant for the situation.	3		ALL
ACP ABES 2.3.2	Assist the pilot.	3	Pilot workload  <i>Optional content: Instructions, information, support, human factors, etc.</i>	ALL
<b>TOPIC ABES 3 - PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS</b>				
<b>Subtopic ABES 3.1 - Application of procedures for ABES</b>				
ACP ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	<i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground based safety nets alerts, airframe failure</i>	ALL
<b>Subtopic ABES 3.2 - Radio failure</b>				
ACP ABES 3.2.1	Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure.	2	ICAO Doc 7030  <i>Optional content: military procedures</i>	ALL
ACP 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 ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3	ICAO Doc 4444	ALL
<b>Subtopic ABES 3.4 - Strayed or unidentified aircraft</b>				
ACP ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	ICAO Doc 4444  <i>Optional content: Inside controlled airspace, Outside controlled airspace</i>	ALL
ACP 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>				
ACP ABES 3.5.1	Provide navigational assistance to diverting emergency aircraft.	4	Track/heading, Distance, Other navigational assistance  <i>Optional content: Nearest most suitable aerodrome</i>	APP ACP APS 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 related subject objective.
  - iii. Subjects, topics and sub-topics are contained in Appendix 7 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(iv) Area Control Procedural Rating — ACP), and are repeated in this AMC to provide the reader with a comprehensive and unique reference document. Subject objectives and training objectives are included in and form integral part of this AMC.

<b>Subject 4 : METEOROLOGY</b>			<b>Subject</b>
<b>TOPIC MET 1 METEOROLOGICAL PHENOMENA</b>			<b>Topic</b>
<b>Sub-topic MET 1.1 - Meteorological phenomena</b>			<b>Sub -topic</b>
ACS (RAD) MET 1.1.1	Appreciate the impact of adverse weather.	3	Thunderstorms, Icing, Jetstreams, Clear Air Turbulence (CAT), Turbulence, Microburst, Severe mountain waves, Line squalls <i>Optional content: Volcanic ash, Solar radiation</i>
ACS (RAD) MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	<i>Optional content: Separation, holding, diversions, re-routings, etc</i>
ACS (RAD) MET 1.1.3	Integrate data about meteorological phenomena into clearances, instructions and transmitted information.	4	<i>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</i>

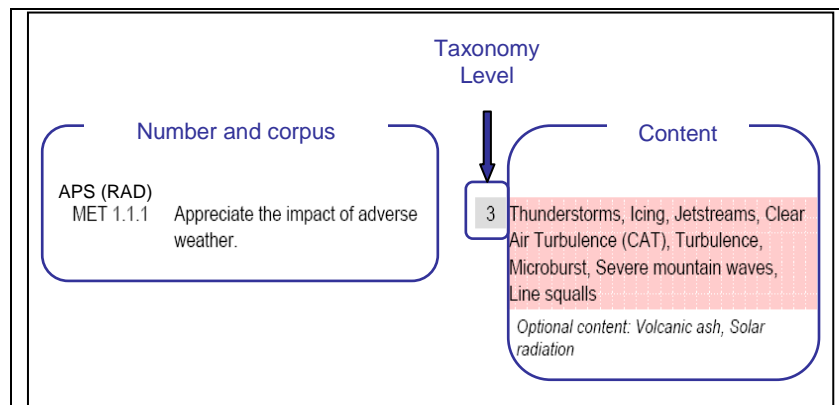
**Figure 1: Layout of syllabus**

- 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 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 APS
APS MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information <i>Optional content: relevant meteorological phenomena</i>	ALL
APS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS 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 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 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	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. 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 Calculate conversions between the three north designations.
<b>Check</b>	Make sure the information is correct (satisfactory)	Check the accuracy of flight data information Check availability of information material.
<b>Choose</b>	Select out of number, decide to do one thing rather than another	Choose appropriate levels. 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

<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
		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. 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. 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 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 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. Respond to distress and urgency messages and signals.
<b>Scan</b>	Continuously observe rapidly, sequentially and selectively in order to	Scan data display



<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
	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. 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.

<b>L4 Verb</b>	<b>Definition</b>	<b>Example</b>
<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. 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. 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. 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. 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. 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 its enclosed Supplement 1.
- B. ATCO Rating training Approach Control Surveillance Rating (APS) should contain the following subject objectives and training objectives that are associated with the subjects, topics and sub-topics contained in **Appendix 8 – Approach Control Surveillance Rating (APS)**.
- C. Subjects, topics and sub-topics from Appendix 8 are repeated in this AMC for the convenience of the reader and do not form part of it.

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## 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 INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
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#### Subtopic INTR 1.2 -Course administration

APS INTR 1.2.1	State course administration.	1		ALL
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#### Subtopic INTR 1.3 -Study material and training documentation

APS INTR 1.3.1	Use appropriate documentation and their sources for course studies.	3	<i>Optional content: Training documentation, library, CBT library, Web, Learning Management Server</i>	ALL
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APS INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation <i>Optional content: supplementary information, library</i>	ALL
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### TOPIC INTR 2 -INTRODUCTION TO THE ATC TRAINING COURSE

#### Subtopic INTR 2.1 -Course content and organisation

APS 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
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APS INTR 2.1.2	State the subjects of the course and their purpose.	1		ALL
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APS INTR 2.1.3	Describe the organisation of theoretical training.	2	<i>Optional content: course programme</i>	ALL
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APS INTR 2.1.4	Describe the organisation of practical training.	2	<i>Optional content: PTP, Simulation, Briefing, Debriefing, course programme</i>	ALL
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#### Subtopic INTR 2.2 -Training ethos

APS INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback	ALL
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#### Subtopic INTR 2.3 -Assessment process

APS INTR 2.3.1	Describe the assessment process.	2		ALL
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**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**

APS LAW 1.1.1	Appreciate the conditions which shall be met to issue an Approach Control Surveillance rating.	3	Commission Regulation (EU) on ATCO Licensing No xxx/yyyy <i>Optional content: National documents</i>	APS
APS LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
APS LAW 1.1.3	Explain the conditions for suspension/revocation of ATCO licence.	2	Commission Regulation (EU) on ATCO Licensing No xxx/yyyy	ALL

**TOPIC LAW 2 - RULES AND REGULATIONS****Subtopic LAW 2.1 - Reports**

APS LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report <i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>	ALL
APS LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, Air traffic incident report <i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>	ALL
APS LAW 2.1.3	Use forms for reporting.	3	Air traffic incident reporting form(s) <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 LAW 2.2.1	Appreciate classes and structure of airspace and their relevance to Approach Control Surveillance rating operations.	3		APS
APS 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 LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL

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**TOPIC LAW 3 - ATC SAFETY MANAGEMENT**


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**Subtopic LAW 3.1 - Feedback process**

APS LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	<i>Optional content: voluntary reporting</i>	ALL
APS LAW 3.1.2	Describe how reported occurrences are analysed.	2	<i>Optional content: ESARR 2, local procedures</i>	ALL
APS LAW 3.1.3	Name the means used to disseminate recommendations.	1	<i>Optional content: Safety letters, safety boards web pages</i>	ALL
APS LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	<b>Benefits, prerequisites, constraints</b> <i>Optional content: EAM 2 GUI 6, GAIN Report</i>	ALL

**Subtopic LAW 3.2 - Safety Investigation**

APS LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
APS LAW 3.2.2	Define working methods of Safety Investigation.	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****Subtopic ATM 1.1 -Air traffic control (ATC) service**

APS ATM 1.1.1	Appreciate own area of responsibility.	3		APP ACP APS ACS
APS ATM 1.1.2	Provide approach control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals	APP APS

**Subtopic ATM 1.2 -Flight information service (FIS)**

APS ATM 1.2.1	Provide FIS.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
APS ATM 1.2.2	Use ATS surveillance system for the provision of FIS.	3	ICAO Doc 4444, Information to identified aircraft concerning: traffic, navigation <i>Optional content: weather</i>	APS ACS
APS ATM 1.2.3	Issue appropriate information concerning the location of conflicting traffic.	3	ICAO Doc 4444, Traffic information, Essential traffic information	APS ACP APP ACP
APS ATM 1.2.4	Appreciate the use of ATIS for the provision of flight information service by approach controller.	3		APP APP

**Subtopic ATM 1.3 -Alerting service (ALRS)**

APS ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
APS ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 <i>Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations</i>	ALL
APS ATM 1.3.3	Use ATS surveillance system for the provision of ALRS.	3		APS ACS

**Subtopic ATM 1.4 -ATS system capacity and air traffic flow management**

APS ATM 1.4.1	Appreciate principles of ATS system capacity and air traffic flow management.	3	<i>Optional content: EUROCONTROL ATFCM Users Manual, FABs, FUA, free flight, etc.</i>	APP ACP APS ACS
APS ATM 1.4.2	Apply flow management procedures in the provision of ATC.	3	<i>Optional content: EUROCONTROL ATFCM Users Manual</i>	APP ACP APS ACS
APS 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 ACP APS ACS

APS 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 ACP APS ACS
APS 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 ACP APS ACS
APS ATM 1.4.6	Organise traffic flows and patterns to take account of ATS surveillance system capability.	4		APS ACS
<b>Subtopic ATM 1.5 - Airspace management (ASM)</b>				
APS 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 ACP APS ACS
APS ATM 1.5.2	Organise traffic to take account of ASM.	4	real-time activation, deactivation or reallocation of airspace <i>Optional content: CDR, TSA, TRA, CBA</i>	APS ACS
<b>TOPIC ATM 2 - COMMUNICATION</b>				
<b>Subtopic ATM 2.1 - Effective communication</b>				
APS ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 <i>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2</i>	ALL
APS ATM 2.1.2	Ensure effective communication.	4	Communication techniques, Readback/verification of readback	ALL
<b>TOPIC ATM 3 - ATC CLEARANCES AND ATC INSTRUCTIONS</b>				
<b>Subtopic ATM 3.1 - ATC clearances</b>				
APS ATM 3.1.1	Issue appropriate ATC clearances.	3	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
APS ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
APS ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL
<b>Subtopic ATM 3.2 - ATC instructions</b>				
APS ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
APS ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL



APS 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>				
APS ATM 4.1.1	Identify the need for coordination.	3		ALL
<b>Subtopic ATM 4.2 - Tools and methods for coordination</b>				
APS 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>				
APS 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 <i>Optional content: release point</i>	ALL
APS 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 ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
APS ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
APS ATM 4.3.5	Coordinate in the provision of FIS.	4	ICAO Doc 4444	ALL
APS 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>				
APS ATM 5.1.1	Allocate levels according to altimetry data.	4	ICAO Doc 8168, ICAO Doc 4444	ALL
APS 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>				

APS 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 ACS
<b>TOPIC ATM 6 - SEPARATIONS</b>				
<b>Subtopic ATM 6.1 - Vertical separation</b>				
APS ATM 6.1.1	Provide standard vertical separation.	4	ICAO Doc 4444, ICAO Doc 7030, Level allocation, During climb/descent, Rate of climb/descent, holding pattern	APP APS
APS ATM 6.1.2	Provide increased vertical separation.	4	ICAO Doc 4444, ICAO Doc 7030 <i>Optional content: Level allocation, During climb/descent, Rate of climb/descent</i>	APP ACP APS ACS
APS ATM 6.1.3	Appreciate the application of vertical emergency separation.	3	ICAO Doc 4444, ICAO Doc 7030	APP ACP APS ACS
APS ATM 6.1.4	Provide vertical separation in a surveillance environment.	4	Pressure altitude-derived information, pilot level reports <i>Optional content: Into/out of ATS surveillance system coverage</i>	APS ACS
<b>Subtopic ATM 6.2 - Longitudinal separation in a surveillance environment</b>				
APS ATM 6.2.1	Provide longitudinal separation in a surveillance environment.	4	Successive departures, successive arrivals, overflights, speed control, silent transfer, ICAO Doc 4444	APS
<b>Subtopic ATM 6.3 - Delegation of separation</b>				
APS ATM 6.3.1	Delegate separation to pilots in the case of aircraft executing successive visual approaches.	4		APP APS
APS 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 APS
<b>Subtopic ATM 6.4 - Wake turbulence distance-based separation</b>				
APS ATM 6.4.1	Provide distance-based wake turbulence separation.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	APS ACS
<b>Subtopic ATM 6.5 - Separation based on ATS surveillance systems</b>				
APS ATM 6.5.1	Describe how separation based on ATS surveillance systems is applied.	2	ICAO Doc 4444	APS ACS
APS ATM 6.5.2	Provide horizontal separation.	4	ICAO Doc 4444, ICAO Doc 7030 Local operation manuals, holding	APS ACS

APS ATM 6.5.3	Provide horizontal separation by vectoring in a variety of situations.	4	<i>Optional content: transit, meteorological phenomena, vectoring for approach, departure vs transit vs arrival</i>	APS ACS
APS ATM 6.5.4	Ensure horizontal or vertical separation from airspace boundaries.	4	adjacent sectors, PRD, TSAs.	APS ACS

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

### Subtopic ATM 7.1 - Airborne collision avoidance systems

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

### Subtopic ATM 7.2 - Ground-based safety nets

APS ATM 7.2.1	Describe the controller responsibility during and following safety net warnings.	2	ICAO Doc 4444 <i>Optional content: STCA, MSAW, APW, APM</i>	APS ACS
APS ATM 7.2.2	Respond to ground-based safety nets warnings.	3	<i>Optional content: STCA, MSAW, APW, APM</i>	APS ACS

## TOPIC ATM 8 - DATA DISPLAY

### Subtopic ATM 8.1 - Data management

APS 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 ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
APS ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
APS ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, Supplementary information <i>Optional content: RPL, AFIL, etc.</i>	ALL
APS 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

APS ATM 9.1.1	Obtain information concerning the operational environment.	3	<i>Optional content: Briefing, notices, local orders, verification of information</i>	ALL
APS 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 ACP APS ACS
<b>Subtopic ATM 9.2 - Verification of the currency of operational procedures</b>				
APS ATM 9.2.1	Check all relevant documentation before managing traffic.	3	<i>Optional content: Briefing, LOAs, NOTAM, AICs</i>	ALL
APS ATM 9.2.2	Manage traffic in accordance with procedural changes.	4		APP ACP APS ACS
<b>Subtopic ATM 9.3 - Handover-takeover</b>				
APS ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
APS 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 ATM 10.1.1	Describe the division of responsibility between air traffic control units.	2	ICAO Doc 4444	ALL
APS ATM 10.1.2	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 <i>Optional content: ICAO Doc 9554</i>	ALL
APS ATM 10.1.3	Describe the responsibility in regard to unmanned free balloons.	2	ICAO Doc 4444	APP ACP APS ACS
APS ATM 10.1.4	Obtain operational information.	3	ICAO Doc 4444, Local operation manuals	APP ACP APS ACS
APS ATM 10.1.5	Interpret operational information.	5		APP ACP APS ACS
APS ATM 10.1.6	Organise forwarding of operational information.	4	<i>Optional content: including the use of backup procedures</i>	APP ACP APS ACS
APS ATM 10.1.7	Integrate operational information into control decisions.	4		APP ACP APS ACS
APS ATM 10.1.8	Appreciate the influence of operational requirements.	3	<i>Optional content: Military flying, Calibration flights, Aerial photography</i>	ALL
<b>Subtopic ATM 10.2 - ATS surveillance service</b>				
APS 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 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 ACS
APS 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 ATM 10.2.4	Apply the procedures for termination of ATS surveillance service.	3	ICAO Doc 4444 <i>Optional content: transfer of control, termination or interruption of ATS surveillance service</i>	APS ACS
<b>Subtopic ATM 10.3 - Traffic management process</b>				
APS ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, scanning, traffic projection	APS ACS
APS ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
APS ATM 10.3.3	Identify potential solutions to achieve a safe and effective traffic flow.	3		APP ACP APS ACS
APS ATM 10.3.4	Evaluate possible outcomes of different planning and control actions.	5		APP ACP APS ACS
APS ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective traffic flow.	5		APP ACP APS ACS
APS ATM 10.3.6	Ensure an adequate priority of actions.	4		ALL
APS ATM 10.3.7	Execute selected plan in a timely manner.	3		APP ACP APS ACS
APS 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>				
APS ATM 10.4.1	Manage arrivals, departures and overflights.	4		APP ACP APS ACS
APS ATM 10.4.2	Balance the workload against personal capacity.	5	<i>Optional content: re-routing, re-planning, prioritising solutions, denying requests, delegating responsibility for separation</i>	APP ACP APS ACS
APS ATM 10.4.3	Define flight path monitoring and vectoring.	1	ICAO Doc 4444	APS ACS
APS ATM 10.4.4	Explain the requirements for vectoring and termination of vectoring.	2	ICAO Doc 4444	APS ACS

APS ATM 10.4.5	Provide vectoring.	4	ICAO Doc 4444 <i>Optional content: separation, expediting arrivals, departures and/or climb to cruising levels, aircraft leaving the hold, navigation assistance, uncontrolled airspace, etc.</i>	APS ACS
APS ATM 10.4.6	Apply the procedures for termination of vectoring.	3	ICAO Doc 4444	APS ACS
APS ATM 10.4.7	Manage traffic on different types of approaches.	4	precision, non-precision, visual	APP APS
APS ATM 10.4.8	Initiate missed approach.	3	ICAO Doc 4444	APP APS
APS ATM 10.4.9	Integrate aircraft on missed approach into the traffic situation.	4		APP APS

### Subtopic ATM 10.5 - Control service with advanced system support

APS ATM 10.5.1	Appreciate the impact of advanced systems on the provision of approach control service.	3	<i>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</i>	APS
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## TOPIC ATM 11 - HOLDING

### Subtopic ATM 11.1 - General holding procedures

APS ATM 11.1.1	Apply holding procedures.	3	ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times	APP ACP APS ACS
APS ATM 11.1.2	Appreciate the factors affecting holding patterns.	3	effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type	APP ACP APS ACS

### Subtopic ATM 11.2 - Approaching aircraft

APS ATM 11.2.1	Calculate Expected Approach Times (EATs) and Expected Onward Clearance times.	3		APP APS
APS ATM 11.2.2	Organise the traffic landing sequence in a holding pattern.	4	<i>Optional content: company preference, aircraft performance, aircraft approach capability, ILS categories, flow control management</i>	APP APS

### Subtopic ATM 11.3 - Holding in a surveillance environment

APS ATM 11.3.1	Organise traffic to separate other aircraft from holding aircraft.	4		APS ACS
APS ATM 11.3.2	Integrate system support, when available.	4	<i>Optional content: arrival management system, automated holding lists, vertical traffic displays</i>	APS ACS

## TOPIC ATM 12 - IDENTIFICATION

### Subtopic ATM 12.1 - Establishment of identification

APS ATM 12.1.1	Appreciate the precautions when establishing identification.	3		APS ACS
APS ATM 12.1.2	Identify aircraft.	3	<i>Optional content: PSR, SSR or ADS identification method</i>	APS ACS
APS ATM 12.1.3	Apply procedures in the case of misidentification.	3		APS ACS
<b>Subtopic ATM 12.2 - Maintenance of identification</b>				
APS ATM 12.2.1	Appreciate the necessity to maintain identification.	3		APS ACS
<b>Subtopic ATM 12.3 - Loss of identity</b>				
APS ATM 12.3.1	Appreciate when an aircraft identification is lost or in doubt.	3	<i>Optional content: Out of ATS surveillance system coverage, failure of ATS surveillance system, weather clutter, other clutter, garbling, holding, etc.</i>	APS ACS
APS ATM 12.3.2	Apply methods to re-establish identification.	3		APS ACS
APS ATM 12.3.3	Respond to loss/doubt concerning identification.	3	<i>Optional content: procedural separation</i>	APS ACS
<b>Subtopic ATM 12.4 - Position Information</b>				
APS ATM 12.4.1	Appreciate the circumstances when position information should be passed to the aircraft.	3		APS ACS
APS ATM 12.4.2	State the format in which position information can be passed to aircraft.	1	ICAO Doc 4444	APS ACS
<b>Subtopic ATM 12.5 - Transfer of identity</b>				
APS ATM 12.5.1	Apply the methods of transfer of identification.	3		APS ACS
APS ATM 12.5.2	Appreciate the precautions when transferring identification.	3		APS 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 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 APS
APS MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information <i>Optional content: relevant meteorological phenomena</i>	ALL
APS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS ACS

**TOPIC MET 2 - SOURCES OF METEOROLOGICAL DATA****Subtopic MET 2.1 - Sources of meteorological information**

APS MET 2.1.1	Obtain meteorological information	3	METAR, TAF, SIGMET, AIRMET <i>Optional content: AIREP/AIREP Special</i>	APP ACP APS ACS
APS MET 2.1.2	Relay meteorological information.	3	ICAO Doc 4444 <i>Optional content: flight information centre, adjacent ATS unit</i>	APP ACP APS 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**

APS 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 <i>Optional content: Military maps and charts</i>	ADI APP APS
APS NAV 1.1.2	Use relevant maps and charts.	3		APP ACP APS ACS

**TOPIC NAV 2 - INSTRUMENT NAVIGATION****Subtopic NAV 2.1 - Navigational systems**

APS NAV 2.1.1	Manage traffic in case of change in the operational status of navigational systems.	4	<i>Optional content: limitations, status of ground-based and satellite-based systems</i>	APP ACP APS ACS
APS NAV 2.1.2	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

**Subtopic NAV 2.2 - Stabilised approach**

APS NAV 2.2.1	Describe the concept of stabilised approach.	2	ICAO Doc 8168, Regulation (EC) No 1899/2006 <i>Optional content: SKYbrary</i>	ADV ADI APP APS
APS NAV 2.2.2	Appreciate the effect of late change of runway-in-use or type of approach for landing aircraft.	3		APP APS
APS 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 NAV 2.3.1	Characterise SIDs.	2		ADI APP APS
APS NAV 2.3.2	Describe the types and phases of instrument approach procedures.	2		APP APS
APS NAV 2.3.3	Describe the relevant minima applicable for a precision/ non-precision and visual approach.	2		ADI APP APS

<b>Subtopic NAV 2.4 - Navigational assistance</b>				
APS NAV 2.4.1	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 ACP APS ACS
APS NAV 2.4.2	Assist aircraft in navigation when required.	3	Aircraft observed to be deviating from its known intended route, on request	APS ACS
<b>Subtopic NAV 2.5 - Satellite-based systems</b>				
APS NAV 2.5.1	State the different applications 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 APS
<b>Subtopic NAV 2.6 - PBN applications</b>				
APS 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) <i>Optional content: A-RNP, EC PBN Implementing Rule, ICAO Doc 9613</i>	APP APS
APS 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 ACP APS ACS
APS NAV 2.6.3	State future PBN developments.	1	A-RNP, APV <i>Optional content: RNP 3D, RNP 4D</i>	ADI APP ACP APS 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 ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
APS ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	<i>Optional content: Radios (number of), emergency radios</i>	ALL
APS ACFT 1.1.3	Explain the operation of on-board surveillance equipment.	2	Transponders: equipment Mode A, Mode C, Mode S, ADS capability	ADI APS ACS

**TOPIC ACFT 2 - AIRCRAFT CATEGORIES****Subtopic ACFT 2.1 - Wake turbulence**

APS ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to the succeeding aircraft.	2		ALL
APS 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 ACFT 2.2.1	Describe the use of ICAO approach categories.	2	ICAO Doc 8168	ADI APP APS
APS ACFT 2.2.2	Appreciate the effect of ICAO approach categories on the traffic organisation.	3		ADI APP APS

**TOPIC ACFT 3 - FACTORS AFFECTING AIRCRAFT PERFORMANCE****Subtopic ACFT 3.1 - Climb factors**

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

**Subtopic ACFT 3.2 - Cruise factors**

APS ACFT 3.2.1	Integrate the influence of factors affecting aircraft during cruise.	4	Level, cruising speed, wind, mass, cabin pressurisation	APP ACP APS ACS
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**Subtopic ACFT 3.3 - Descent and initial approach factors**

APS 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 APS
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### Subtopic ACFT 3.4 -Final approach and landing factors

APS 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 APS
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### Subtopic ACFT 3.5 -Economic factors

APS 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 APS
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APS ACFT 3.5.2	Use continuous climb techniques where applicable.	3		APP ACP APS ACS
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APS ACFT 3.5.3	Use direct routing where applicable.	3		APP ACP APS ACS
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### Subtopic ACFT 3.6 -Environmental factors

APS ACFT 3.6.1	Appreciate the performance restrictions due to environmental constraints.	3	<i>Optional content: Fuel dumping, Noise abatement procedures, Minimum flight levels, Bird hazard, Continuous Descent Operations</i>	APP APS
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## TOPIC ACFT 4 -AIRCRAFT DATA

### Subtopic ACFT 4.1 -Performance data

APS 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 ACP APS ACS
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## 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

APS HUM 1.1.1	Describe the human information processing model.	2	Attention, perception, memory, situational awareness, decision making, response	ALL
APS 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 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 HUM 2.1.1	State factors that cause fatigue.	1	Shift work <i>Optional content: night shifts and rosters</i>	ALL
APS 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 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 HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
APS HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL

#### Subtopic HUM 2.2 - Fitness

APS HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
APS 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 HUM 3.1.1	State the relevance of TRM.	1	<i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>	ALL
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APS 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>				
APS HUM 3.2.1	Identify reasons for conflict.	3		ALL
APS HUM 3.2.2	Describe actions to prevent human conflicts.	2	<i>Optional content: TRM team roles</i>	ALL
APS 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>				
APS 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
APS 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>				
APS 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>				
APS 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 HUM 4.2.2	Respond to stressful situation by offering, asking or accepting assistance.	3	<i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i>	ALL
APS HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, Abnormal situations, CISM	ALL
APS HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
APS HUM 4.2.5	Explain procedures used following an incident/accident.	2	<i>Optional content: CISM, Counselling, Human element</i>	ALL
<b>TOPIC HUM 5 - HUMAN ERROR</b>				
<b>Subtopic HUM 5.1 - Human error</b>				

APS 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  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
APS HUM 5.1.2	Differentiate between the types of error.	2	Slips, Lapses, Mistakes  <i>Optional content: Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
APS 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 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 HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
APS HUM 5.1.6	Execute corrective actions.	3	Error compensation  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
APS 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
APS 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>				
APS 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 - COLLABORATIVE WORK</b>				
<b>Subtopic HUM 6.1 - Communication</b>				
APS HUM 6.1.1	Use communication effectively in ATC.	3		ALL
APS HUM 6.1.2	Analyse examples of pilot and controller communication for effectiveness.	4		ALL
<b>Subtopic HUM 6.2 - Collaborative work within the same area of</b>				
APS HUM 6.2.1	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 HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	<i>Optional content: Strips legibility and encoding, labels designation, Feedback</i>	ALL

APS HUM 6.2.3	List possible actions to provide a safe position handover.	1	<i>Optional content: rigour, preparation, overlap time</i>	ALL
APS HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
<b>Subtopic HUM 6.3 - Collaborative work between different areas of</b>				
APS HUM 6.3.1	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>				
APS HUM 6.4.1	Describe parameters affecting controller/pilot cooperation.	2	<i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>	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

APS EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, Procedures  <i>Optional content: Frequency selection, Standby equipment</i>	ALL
APS 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
APS 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 ACP APS ACS

#### Subtopic EQPS 1.2 - Other voice communications

APS EQPS 1.2.1	Operate landline communications.	3	<i>Optional content: telephone, interphone and intercom equipment</i>	ALL
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### TOPIC EQPS 2 - AUTOMATION IN ATS

#### Subtopic EQPS 2.1 - Aeronautical fixed telecommunication network (AFTN)

APS EQPS 2.1.1	Decode AFTN messages.	3	<i>Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.</i>	ALL
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#### Subtopic EQPS 2.2 - Automatic data interchange

APS EQPS 2.2.1	Use automatic data transfer equipment where available.	3	<i>Optional content: Sequencing systems, Automated information and coordination, OLDI</i>	ADV ADI APS ACS
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### TOPIC EQPS 3 - CONTROLLER WORKING POSITION

#### Subtopic EQPS 3.1 - Operation and monitoring of equipment

APS EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, Responsibilities	ALL
APS 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, UDF/VDF</i>	ALL
APS EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL

#### Subtopic EQPS 3.2 - Situation displays and information systems

APS EQPS 3.2.1	Use situation displays.	3		ALL
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APS EQPS 3.2.2	Check availability of information material.	3		ALL
APS EQPS 3.2.3	Obtain information from equipment.	3		APP ACP APS ACS
<b>Subtopic EQPS 3.3 -Flight data systems</b>				
APS 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 EQPS 3.4.1	Use the ATS surveillance system functions.	3		APS ACS
APS EQPS 3.4.2	Analyse the information provided by the ATS surveillance system.	4		APS ACS
APS EQPS 3.4.3	Assign codes.	4		APS ACS
APS EQPS 3.4.4	Appreciate the use of advanced surveillance technology.	3	<i>Optional content: Mode S, ADS-B, MLAT</i>	APS ACS
<b>Subtopic EQPS 3.5 -Advanced systems</b>				
APS EQPS 3.5.1	Appreciate the use of controller pilot datalink communications when available.	3		APS ACS
APS EQPS 3.5.2	Appreciate the use of information provided by advanced systems.	3	<i>Optional content: trajectory-based information, MTCD, MONA, etc.</i>	APS ACS
<b>TOPIC EQPS 4 - FUTURE EQUIPMENT</b>				
<b>Subtopic EQPS 4.1 -New developments</b>				
APS 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 EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
APS 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 EQPS 5.2.1	Identify that communication equipment has degraded.	3	<i>Optional content: Ground-air and landline communications</i>	APP ACP APS ACS

APS EQPS 5.2.2	Apply 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 ACP APS ACS
<b>Subtopic EQPS 5.3 - Navigational equipment degradation</b>				
APS EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	<i>Optional content: VOR, Navigational aids</i>	ALL
APS EQPS 5.3.2	Apply 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 APP ACP APS ACS
<b>Subtopic EQPS 5.4 - Surveillance equipment degradation</b>				
APS EQPS 5.4.1	Identify that surveillance equipment has degraded.	3	Partial power failure, Loss of certain facilities, Total failure	APS ACS
APS 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 ACS
<b>Subtopic EQPS 5.5 - ATC processing system degradation</b>				
APS EQPS 5.5.1	Identify a processing system degradation.	3	<i>Optional content: FDPS, SDPS, Software processing of situation display</i>	APS ACS
APS EQPS 5.5.2	Apply contingency procedures in the event of a processing system degradation.	3		APS 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****Subtopic PEN 1.1 - Study visit to approach control unit**

APS PEN 1.1.1	Appreciate the functions and provision of an operational approach control service.	3	study visit to an approach control unit	APP APS
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**TOPIC PEN 2 - AIRSPACE USERS****Subtopic PEN 2.1 - Contributors to civil ATS operations**

APS PEN 2.1.1	Characterise civil ATS activities in approach control unit.	2	Study visit to an approach control unit <i>Optional content: familiarisation visits to TWR, ACC, AIS, RCC</i>	APP APS
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APS PEN 2.1.2	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
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**Subtopic PEN 2.2 - Contributors to military ATS operations**

APS PEN 2.2.1	Characterise military ATS activities.	2	<i>Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units</i>	ALL
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**TOPIC PEN 3 - CUSTOMER RELATIONS****Subtopic PEN 3.1 - Provision of services and user requirements**

APS PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
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APS PEN 3.1.2	Appreciate ATS users requirements.	3		ALL
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**TOPIC PEN 4 - ENVIRONMENTAL PROTECTION****Subtopic PEN 4.1 - Environmental protection**

APS PEN 4.1.1	Describe the environmental constraints on aerodrome operations.	2	<i>Optional content: CAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions</i>	ADV ADI APP APS
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APS PEN 4.1.2	Explain the use of Collaborative Environmental Management (CEM) process at airports.	2		ADV ADI APP APS
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APS PEN 4.1.3	Appreciate the mitigation techniques used to minimise aviation's impact on the environment.	3	<i>Optional content: Continuous Descent Operations (CDO), Noise abatement procedures, Noise Preferential Routes, flight efficiency</i>	APP APS
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## Subject 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in abnormal and emergency situations.

### TOPIC ABES 1 - ABNORMAL AND EMERGENCY SITUATIONS (ABES)

#### Subtopic ABES 1.1 - Overview of ABES

APS ABES 1.1.1	List common abnormal and emergency situations.	1	<i>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</i>	ALL
APS ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
APS ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	<i>Optional content: ICAO Doc 4444</i>	APP ACP APS ACS
APS ABES 1.1.4	Take into account that procedures don't exist for all abnormal and emergency situations.	2	<i>Optional content: real life examples</i>	ALL
APS ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	<i>Optional content: Separation, Information, Coordination</i>	ALL

### TOPIC ABES 2 - SKILLS IMPROVEMENT

#### Subtopic ABES 2.1 - Communication effectiveness

APS 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 ABES 2.1.2	Apply change of radiotelephony call sign.	3	ICAO Doc 4444	ALL

#### Subtopic ABES 2.2 - Avoidance of mental overload

APS ABES 2.2.1	Describe actions to keep the control of the situation.	2	<i>Optional content: sector splitting, holding, flow management, task delegation</i>	ALL
APS ABES 2.2.2	Organise priority of actions.	4		ALL
APS 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 ABES 2.2.4	Consider asking for help.	2		ALL

#### Subtopic ABES 2.3 - Air / ground cooperation

APS ABES 2.3.1	Collect appropriate information relevant for the situation.	3		ALL
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APS ABES 2.3.2	Assist the pilot.	3	Pilot workload <i>Optional content: Instructions, information, support, human factors, etc.</i>	ALL
<b>TOPIC ABES 3 - PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS</b>				
<b>Subtopic ABES 3.1 - Application of procedures for ABES</b>				
APS ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	<i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground based safety nets alerts, airframe failure</i>	ALL
<b>Subtopic ABES 3.2 - Radio failure</b>				
APS ABES 3.2.1	Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure.	2	ICAO Doc 7030 <i>Optional content: military procedures</i>	ALL
APS 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 ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3	ICAO Doc 4444	ALL
<b>Subtopic ABES 3.4 - Strayed or unidentified aircraft</b>				
APS ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	ICAO Doc 4444 <i>Optional content: Inside controlled airspace, Outside controlled airspace</i>	ALL
APS 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>				
APS ABES 3.5.1	Provide navigational assistance to diverting emergency aircraft.	4	Track/heading, Distance, Other navigational assistance <i>Optional content: Nearest most suitable aerodrome</i>	APP ACP APS ACS
<b>Subtopic ABES 3.6 - Transponder failure</b>				
APS ABES 3.6.1	Apply procedures in the event of an SSR transponder failure.	3	ICAO Doc 4444, ICAO Doc 7030 <i>Optional content: total/partial failure, impact on ADS-B/Mode S capability</i>	APS 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 AGA 1.1.1	Define aerodrome data.	1	ICAO Annex 14 <i>Optional content: Aerodrome elevation, Reference point, Apron, Movement area, Manoeuvring area, Hot spot</i>	ADV ADI APP APS
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**Subtopic AGA 1.2 - Coordination**

APS 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 APS ADI
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**TOPIC AGA 2 - MOVEMENT AREA****Subtopic AGA 2.1 - Movement area**

APS AGA 2.1.1	Describe movement area.	2	ICAO Annex 14	ADV ADI APP APS
APS AGA 2.1.2	Describe the marking of obstacles and unusable or unserviceable areas.	2	Flags, Signs on pavement, Lights	ADV ADI APP APS
APS 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 ADI APP APS

**Subtopic AGA 2.2 - Manoeuvring area**

APS AGA 2.2.1	Describe manoeuvring area.	2	ICAO Annex 14	ADV ADI APP APS
APS AGA 2.2.2	Describe taxiway.	2		ADV ADI APP APS
APS AGA 2.2.3	Describe the daylight marking on taxiways.	2		ADV ADI APP APS
APS AGA 2.2.4	Describe taxiway lighting.	2		ADV ADI APP APS

**Subtopic AGA 2.3 - Runways**

APS AGA 2.3.1	Describe runway.	2	Runway, Runway surface, Runway strip, Shoulder, Runway end safety areas, Clearways, Stopways	ADV ADI APP APS
APS AGA 2.3.2	Describe instrument runway.	2	ICAO Annex 14	ADI APP APS

APS AGA 2.3.3	Describe non-instrument runway.	2	ICAO Annex 14	ADV ADI APP APS
APS AGA 2.3.4	Explain declared distances.	2	TORA, TODA, ASDA, LDA	ADV ADI APP APS
APS AGA 2.3.5	Explain the differences between ACN and PCN.	2	Strength of pavements	ADV ADI APP APS
APS 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 ADI APP APS
APS AGA 2.3.7	Describe runway lights.	2	<i>Optional content: Colour, Centre line, Intensity, Edge, Touchdown zone, Threshold, Barettes</i>	ADV ADI APP APS
APS AGA 2.3.8	Explain the functions of visual landing aids.	2	<i>Optional content: AVASI, VASI, PAPI</i>	ADV ADI APP APS
APS AGA 2.3.9	Describe the approach lighting systems.	2	Centre line, cross bars, Stroboscopic lights, Colours, Intensity and brightness	ADV ADI APP APS
APS AGA 2.3.10	Characterise the effect of water/ice on runways.	2		ADV ADI APP APS
APS AGA 2.3.11	Explain braking action.	2	Braking action coefficient	ADV ADI APP APS
APS AGA 2.3.12	Explain the effect of runway visual range on aerodrome operation	2		ADV ADI APP 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 ADI APP APS
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## TOPIC AGA 4 - MISCELLANEOUS EQUIPMENT

### Subtopic AGA 4.1 - Location

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 ADI APP APS
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**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 related subject objective.
  - iii. Subjects, topics and sub-topics are contained in Appendix 8 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(v) Approach Control Surveillance Rating — APS), and are repeated in this AMC to provide the reader with a comprehensive and unique reference document. Subject objectives and training objectives are included in and form integral part of this AMC.

<b>Subject 4 : METEOROLOGY</b> ← <b>Subject</b>		
<b>TOPIC MET 1 METEOROLOGICAL PHENOMENA</b> ← <b>Topic</b>		
<b>Sub-topic MET 1.1 - Meteorological phenomena</b> ← <b>Sub -topic</b>		
ACS (RAD) MET 1.1.1	Appreciate the impact of adverse weather.	3 Thunderstorms, Icing, Jetstreams, Clear Air Turbulence (CAT), Turbulence, Microburst, Severe mountain waves, Line squalls <i>Optional content: Volcanic ash, Solar radiation</i>
ACS (RAD) MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4 <i>Optional content: Separation, holding, diversions, re-routings, etc</i>
ACS (RAD) MET 1.1.3	Integrate data about meteorological phenomena into clearances, instructions and transmitted information.	4 <i>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</i>

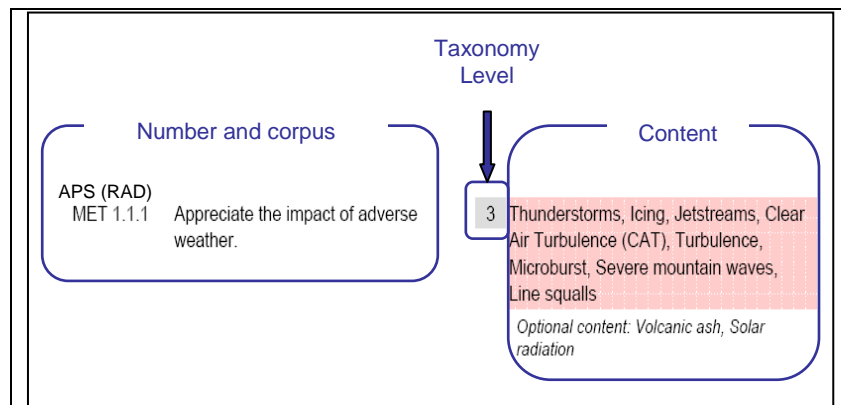
**Figure 1: Layout of syllabus**

- 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 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 APS
APS MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information <i>Optional content: relevant meteorological phenomena</i>	ALL
APS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS 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 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 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	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. 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 Calculate conversions between the three north designations.
<b>Check</b>	Make sure the information is correct (satisfactory)	Check the accuracy of flight data information Check availability of information material.
<b>Choose</b>	Select out of number, decide to do one thing rather than another	Choose appropriate levels. 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

<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
		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. 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. 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 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 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. Respond to distress and urgency messages and signals.
<b>Scan</b>	Continuously observe rapidly, sequentially and selectively in order to	Scan data display



<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
	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. 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.

<b>L4 Verb</b>	<b>Definition</b>	<b>Example</b>
<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. 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. 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.

<b>L4 Verb</b>	<b>Definition</b>	<b>Example</b>
	parts	
<b>Manage</b>	Handle, wield, conduct	Manage traffic on the manoeuvring area. 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. 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. 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.

<b>L5 verb</b>	<b>Definition</b>	<b>Example</b>
<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 9 –  
Area Control Surveillance Rating (ACS)**

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

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## 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 INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
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#### Subtopic INTR 1.2 -Course administration

ACS INTR 1.2.1	State course administration.	1		ALL
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#### Subtopic INTR 1.3 -Study material and training documentation

ACS INTR 1.3.1	Use appropriate documentation and their sources for course studies.	3	<i>Optional content: Training documentation, library, CBT library, Web, Learning Management Server</i>	ALL
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ACS INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation <i>Optional content: supplementary information, library</i>	ALL
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### TOPIC INTR 2 -INTRODUCTION TO THE ATC TRAINING COURSE

#### Subtopic INTR 2.1 -Course content and organisation

ACS 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
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ACS INTR 2.1.2	State the subjects of the course and their purpose.	1		ALL
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ACS INTR 2.1.3	Describe the organisation of theoretical training.	2	<i>Optional content: course programme</i>	ALL
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ACS INTR 2.1.4	Describe the organisation of practical training.	2	<i>Optional content: PTP, Simulation, Briefing, Debriefing, course programme</i>	ALL
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#### Subtopic INTR 2.2 -Training ethos

ACS INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, Assessment, Briefing, Debriefing, Learner/instructor feedback, Instructor/instructor feedback	ALL
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#### Subtopic INTR 2.3 -Assessment process

ACS INTR 2.3.1	Describe the assessment process.	2		ALL
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**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 LAW 1.1.1	Appreciate the conditions which shall be met to issue an Area Control Surveillance rating.	3	Commission Regulation (EU) on ATCO Licensing No xxx/yyyy <i>Optional content: National documents</i>	ACS
ACS LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
ACS LAW 1.1.3	Explain the conditions for suspension/revocation of ATCO licence.	2	Commission Regulation (EU) on ATCO Licensing No xxx/yyyy	ALL

**TOPIC LAW 2 - RULES AND REGULATIONS****Subtopic LAW 2.1 - Reports**

ACS LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report <i>Optional content: routine air reports, breach of regulations, watch/log book, records</i>	ALL
ACS LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, Air traffic incident report <i>Optional content: breach of regulations, watch/log book, records, voluntary reporting, ESARR 2</i>	ALL
ACS LAW 2.1.3	Use forms for reporting.	3	Air traffic incident reporting form(s) <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 LAW 2.2.1	Appreciate classes and structure of airspace and their relevance to Area Control Surveillance rating operations.	3		ACS
ACS 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 LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL

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**TOPIC LAW 3 - ATC SAFETY MANAGEMENT**


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**Subtopic LAW 3.1 - Feedback process**

ACS LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	<i>Optional content: voluntary reporting</i>	ALL
ACS LAW 3.1.2	Describe how reported occurrences are analysed.	2	<i>Optional content: ESARR 2, local procedures</i>	ALL
ACS LAW 3.1.3	Name the means used to disseminate recommendations.	1	<i>Optional content: Safety letters, safety boards web pages</i>	ALL
ACS LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	<b>Benefits, prerequisites, constraints</b> <i>Optional content: EAM 2 GUI 6, GAIN Report</i>	ALL

**Subtopic LAW 3.2 - Safety Investigation**

ACS LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
ACS LAW 3.2.2	Define working methods of Safety Investigation.	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****Subtopic ATM 1.1 -Air traffic control (ATC) service**

ACS ATM 1.1.1	Appreciate own area of responsibility.	3		APP ACP APS ACS
ACS ATM 1.1.2	Provide area control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, Operation manuals	ACP ACS

**Subtopic ATM 1.2 -Flight information service (FIS)**

ACS ATM 1.2.1	Provide FIS.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ACS ATM 1.2.2	Use ATS surveillance system for the provision of FIS.	3	ICAO Doc 4444, Information to identified aircraft concerning: traffic, navigation <i>Optional content: weather</i>	APS ACS
ACS ATM 1.2.3	Issue appropriate information concerning the location of conflicting traffic.	3	ICAO Doc 4444, Traffic information, Essential traffic information	APS ACS APP ACP

**Subtopic ATM 1.3 -Alerting service (ALRS)**

ACS ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ACS ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 <i>Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations</i>	ALL
ACS ATM 1.3.3	Use ATS surveillance system for the provision of ALRS.	3		APS ACS

**Subtopic ATM 1.4 -ATS system capacity and air traffic flow management**

ACS ATM 1.4.1	Appreciate principles of ATS system capacity and air traffic flow management.	3	<i>Optional content: EUROCONTROL ATFCM Users Manual, FABs, FUA, free flight, etc.</i>	APP ACP APS ACS
ACS ATM 1.4.2	Apply flow management procedures in the provision of ATC.	3	<i>Optional content: EUROCONTROL ATFCM Users Manual</i>	APP ACP APS ACS
ACS 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 ACP APS ACS
ACS 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 ACP APS ACS

ACS 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 ACP APS ACS
ACS ATM 1.4.6	Organise traffic flows and patterns to take account of ATS surveillance system capability.	4		APS ACS
<b>Subtopic ATM 1.5 - Airspace management (ASM)</b>				
ACS 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 ACP APS ACS
ACS ATM 1.5.2	Organise traffic to take account of ASM.	4	real-time activation, deactivation or reallocation of airspace <i>Optional content: CDR, TSA, TRA, CBA</i>	APS ACS
<b>TOPIC ATM 2 - COMMUNICATION</b>				
<b>Subtopic ATM 2.1 - Effective communication</b>				
ACS ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 <i>Optional content: ICAO Doc 9432 RTF manual, Standard words and phrases as contained in ICAO Annex 10 Vol. 2</i>	ALL
ACS ATM 2.1.2	Ensure effective communication.	4	Communication techniques, Readback/verification of readback	ALL
<b>TOPIC ATM 3 - ATC CLEARANCES AND ATC INSTRUCTIONS</b>				
<b>Subtopic ATM 3.1 - ATC clearances</b>				
ACS ATM 3.1.1	Issue appropriate ATC clearances.	3	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ACS ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
ACS ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL
<b>Subtopic ATM 3.2 - ATC instructions</b>				
ACS ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 <i>Optional content: national documents</i>	ALL
ACS ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
ACS 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

ACS ATM 4.1.1	Identify the need for coordination.	3		ALL
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### Subtopic ATM 4.2 - Tools and methods for coordination

ACS 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
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### Subtopic ATM 4.3 - Coordination procedures

ACS 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 <i>Optional content: release point</i>	ALL
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ACS 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
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ACS ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
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ACS ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
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ACS ATM 4.3.5	Coordinate in the provision of FIS.	4	ICAO Doc 4444	ALL
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ACS ATM 4.3.6	Coordinate in the provision of ALRS.	4	ICAO Doc 4444	ALL
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## TOPIC ATM 5 - ALTIMETRY AND LEVEL ALLOCATION

### Subtopic ATM 5.1 - Altimetry

ACS ATM 5.1.1	Allocate levels according to altimetry data.	4	ICAO Doc 8168, ICAO Doc 4444	ALL
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ACS 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
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### Subtopic ATM 5.2 - Terrain clearance

ACS 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 ACS
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## TOPIC ATM 6 -SEPARATIONS

### Subtopic ATM 6.1 -Vertical separation

ACS 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, holding pattern	ACP ACS
ACS ATM 6.1.2	Provide increased vertical separation.	4	ICAO Doc 4444, ICAO Doc 7030 <i>Optional content: Level allocation, During climb/descent, Rate of climb/descent</i>	APP ACP APS ACS
ACS ATM 6.1.3	Appreciate the application of vertical emergency separation.	3	ICAO Doc 4444, ICAO Doc 7030	APP ACP APS ACS
ACS ATM 6.1.4	Provide vertical separation in a surveillance environment.	4	Pressure altitude-derived information, pilot level reports <i>Optional content: Into/out of ATS surveillance system coverage</i>	APS ACS

### Subtopic ATM 6.2 -Longitudinal separation in a surveillance environment

ACS 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	ACS
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### Subtopic ATM 6.3 -Wake turbulence distance-based separation

ACS ATM 6.3.1	Provide distance-based wake turbulence separation.	4	ICAO Doc 4444 <i>Optional content: national documents</i>	APS ACS
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### Subtopic ATM 6.4 -Separation based on ATS surveillance systems

ACS ATM 6.4.1	Describe how separation based on ATS surveillance systems is applied.	2	ICAO Doc 4444	APS ACS
ACS ATM 6.4.2	Provide horizontal separation.	4	ICAO Doc 4444, ICAO Doc 7030 Local operation manuals, holding	APS ACS
ACS ATM 6.4.3	Provide horizontal separation by vectoring in a variety of situations.	4	<i>Optional content: transit, meteorological phenomena, vectoring for approach, departure vs transit vs arrival</i>	APS ACS
ACS ATM 6.4.4	Ensure horizontal or vertical separation from airspace boundaries.	4	adjacent sectors, PRD, TSAs.	APS ACS

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

### Subtopic ATM 7.1 -Airborne collision avoidance systems

ACS ATM 7.1.1	Differentiate between ACAS advisory thresholds and separation standards applicable in the area control environment.	2	ICAO Doc 9863 <i>Optional content: EUROCONTROL TCAS Web page</i>	ACP ACS
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ACS ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
ACS ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	ACAS, TAWS <i>Optional content: EUROCONTROL TCAS Web page</i>	APP ACP APS ACS
<b>Subtopic ATM 7.2 -Ground-based safety nets</b>				
ACS ATM 7.2.1	Describe the controller responsibility during and following safety net warnings.	2	ICAO Doc 4444 <i>Optional content: STCA, MSAW, APW, APM</i>	APS ACS
ACS ATM 7.2.2	Respond to ground-based safety nets warnings.	3	<i>Optional content: STCA, MSAW, APW, APM</i>	APS ACS
<b>TOPIC ATM 8 - DATA DISPLAY</b>				
<b>Subtopic ATM 8.1 -Data management</b>				
ACS 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 ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
ACS ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
ACS ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, Supplementary information <i>Optional content: RPL, AFIL, etc.</i>	ALL
ACS ATM 8.1.5	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>				
ACS ATM 9.1.1	Obtain information concerning the operational environment.	3	<i>Optional content: Briefing, notices, local orders, verification of information</i>	ALL
ACS 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 ACP APS ACS
<b>Subtopic ATM 9.2 -Verification of the currency of operational procedures</b>				
ACS ATM 9.2.1	Check all relevant documentation before managing traffic.	3	<i>Optional content: Briefing, LOAs, NOTAM, AICs</i>	ALL
ACS ATM 9.2.2	Manage traffic in accordance with procedural changes.	4		APP ACP APS ACS
<b>Subtopic ATM 9.3 -Handover-takeover</b>				
ACS ATM 9.3.1	Transfer information to the relieving controller.	3		ALL

ACS 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 ATM 10.1.1	Describe the division of responsibility between air traffic control units.	2	ICAO Doc 4444	ALL
ACS ATM 10.1.2	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 <i>Optional content: ICAO Doc 9554</i>	ALL
ACS ATM 10.1.3	Describe the responsibility in regard to unmanned free balloons.	2	ICAO Doc 4444	APP ACP APS ACS
ACS ATM 10.1.4	Obtain operational information.	3	ICAO Doc 4444, Local operation manuals	APP ACP APS ACS
ACS ATM 10.1.5	Interpret operational information.	5		APP ACP APS ACS
ACS ATM 10.1.6	Organise forwarding of operational information.	4	<i>Optional content: including the use of backup procedures</i>	APP ACP APS ACS
ACS ATM 10.1.7	Integrate operational information into control decisions.	4		APP ACP APS ACS
ACS ATM 10.1.8	Appreciate the influence of operational requirements.	3	<i>Optional content: Military flying, Calibration flights, Aerial photography</i>	ALL
<b>Subtopic ATM 10.2 -ATS surveillance service</b>				
ACS 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 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 ACS
ACS 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 ATM 10.2.4	Apply the procedures for termination of ATS surveillance service.	3	ICAO Doc 4444 <i>Optional content: transfer of control, termination or interruption of ATS surveillance service</i>	APS ACS
<b>Subtopic ATM 10.3 -Traffic management process</b>				
ACS ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, scanning, traffic projection	APS ACS
ACS ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL

ACS ATM 10.3.3	Identify potential solutions to achieve a safe and effective traffic flow.	3		APP ACP APS ACS
ACS ATM 10.3.4	Evaluate possible outcomes of different planning and control actions.	5		APP ACP APS ACS
ACS ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective traffic flow.	5		APP ACP APS ACS
ACS ATM 10.3.6	Ensure an adequate priority of actions.	4		ALL
ACS ATM 10.3.7	Execute selected plan in a timely manner.	3		APP ACP APS ACS
ACS 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>				
ACS ATM 10.4.1	Manage arrivals, departures and overflights.	4		APP ACP APS ACS
ACS ATM 10.4.2	Balance the workload against personal capacity.	5	<i>Optional content: re-routing, re-planning, prioritising solutions, denying requests, delegating responsibility for separation</i>	APP ACP APS ACS
ACS ATM 10.4.3	Define flight path monitoring and vectoring.	1	ICAO Doc 4444	APS ACS
ACS ATM 10.4.4	Explain the requirements for vectoring and termination of vectoring.	2	ICAO Doc 4444	APS ACS
ACS ATM 10.4.5	Provide vectoring.	4	ICAO Doc 4444 <i>Optional content: separation, expediting arrivals, departures and/or climb to cruising levels, aircraft leaving the hold, navigation assistance, uncontrolled airspace, etc.</i>	APS ACS
ACS ATM 10.4.6	Apply the procedures for termination of vectoring.	3	ICAO Doc 4444	APS ACS
<b>Subtopic ATM 10.5 - Control service with advanced system support</b>				
ACS ATM 10.5.1	Appreciate the impact of advanced systems on the provision of area control service.	3	<i>Optional content: sequencing systems, automated holding lists, vertical traffic displays, conflict detection and decision making tools, automated information and coordination tools</i>	ACS
<b>TOPIC ATM 11 - HOLDING</b>				
<b>Subtopic ATM 11.1 - General holding procedures</b>				
ACS ATM 11.1.1	Apply holding procedures.	3	ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times	APP ACP APS ACS

ACS ATM 11.1.2	Appreciate the factors affecting holding patterns.	3	effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type	APP ACP APS ACS
<b>Subtopic ATM 11.2 -Holding aircraft</b>				
ACS ATM 11.2.1	Calculate expected onward clearance times.	3		ACP ACS
<b>Subtopic ATM 11.3 -Holding in a surveillance environment</b>				
ACS ATM 11.3.1	Organise traffic to separate other aircraft from holding aircraft.	4		APS ACS
ACS ATM 11.3.2	Integrate system support, when available.	4	<i>Optional content: arrival management system, automated holding lists, vertical traffic displays</i>	APS ACS
<b>TOPIC ATM 12 - IDENTIFICATION</b>				
<b>Subtopic ATM 12.1 -Establishment of identification</b>				
ACS ATM 12.1.1	Appreciate the precautions when establishing identification.	3		APS ACS
ACS ATM 12.1.2	Identify aircraft.	3	<i>Optional content: PSR, SSR or ADS identification method</i>	APS ACS
ACS ATM 12.1.3	Apply procedures in the case of misidentification.	3		APS ACS
<b>Subtopic ATM 12.2 -Maintenance of identification</b>				
ACS ATM 12.2.1	Appreciate the necessity to maintain identification.	3		APS ACS
<b>Subtopic ATM 12.3 -Loss of identity</b>				
ACS ATM 12.3.1	Appreciate when an aircraft identification is lost or in doubt.	3	<i>Optional content: Out of ATS surveillance system coverage, failure of ATS surveillance system, weather clutter, other clutter, garbling, holding, etc.</i>	APS ACS
ACS ATM 12.3.2	Apply methods to re-establish identification.	3		APS ACS
ACS ATM 12.3.3	Respond to loss/doubt concerning identification.	3	<i>Optional content: procedural separation</i>	APS ACS
<b>Subtopic ATM 12.4 -Position Information</b>				
ACS ATM 12.4.1	Appreciate the circumstances when position information should be passed to the aircraft.	3		APS ACS
ACS ATM 12.4.2	State the format in which position information can be passed to aircraft.	1	ICAO Doc 4444	APS ACS
<b>Subtopic ATM 12.5 -Transfer of identity</b>				

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ACS ATM 12.5.1	Apply the methods of transfer of identification.	3	APS ACS
ACS ATM 12.5.2	Appreciate the precautions when transferring identification.	3	APS ACS

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**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 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, Volcanic ash <i>Optional content: Solar radiation</i>	ACP ACS
ACS MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information <i>Optional content: relevant meteorological phenomena</i>	ALL
ACS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS ACS

**TOPIC MET 2 - SOURCES OF METEOROLOGICAL DATA****Subtopic MET 2.1 - Sources of meteorological information**

ACS MET 2.1.1	Obtain meteorological information	3	METAR, TAF, SIGMET, AIRMET <i>Optional content: AIREP/AIREP Special</i>	APP ACP APS ACS
ACS MET 2.1.2	Relay meteorological information.	3	ICAO Doc 4444 <i>Optional content: flight information centre, adjacent ATS unit</i>	APP ACP APS 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 NAV 1.1.1	Use relevant maps and charts.	3		APP ACP APS ACS
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**TOPIC NAV 2 - INSTRUMENT NAVIGATION****Subtopic NAV 2.1 - Navigational systems**

ACS NAV 2.1.1	Manage traffic in case of change in the operational status of navigational systems.	4	<i>Optional content: limitations, status of ground-based and satellite-based systems</i>	APP ACP APS ACS
ACS NAV 2.1.2	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

**Subtopic NAV 2.2 - Navigational assistance**

ACS NAV 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 ACP APS ACS
ACS NAV 2.2.2	Assist aircraft in navigation when required.	3	Aircraft observed to be deviating from its known intended route, on request	APS ACS

**Subtopic NAV 2.3 - PBN applications**

ACS NAV 2.3.1	State the navigation applications used in terminal and en-route environments.	1	Terminal-RNAV-1 ( $\approx$ P-RNAV); En-route-RNAV-5 (B-RNAV) <i>Optional content: A-RNP, EC PBN Implementing Rule, ICAO Doc 9613</i>	ACP ACS
ACS NAV 2.3.2	Explain the principles and designation of navigation specifications in use.	2	<i>Optional content: performance, functionality, sensors, aircrew and controller requirements</i>	APP ACP APS ACS
ACS NAV 2.3.3	State future PBN developments.	1	A-RNP, APV <i>Optional content: RNP 3D, RNP 4D</i>	ADI APP ACP APS 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 ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
ACS ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	<i>Optional content: Radios (number of), emergency radios</i>	ALL
ACS ACFT 1.1.3	Explain the operation of on-board surveillance equipment.	2	Transponders: equipment Mode A, Mode C, Mode S, ADS capability	ADI APS ACS

**TOPIC ACFT 2 - AIRCRAFT CATEGORIES****Subtopic ACFT 2.1 - Wake turbulence**

ACS ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to the succeeding aircraft.	2		ALL
ACS 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 ACFT 3.1.1	Integrate the influence of factors affecting aircraft during climb.	4	<i>Optional content: speed, mass, air density, cabin pressurisation, wind and temperature</i>	APP ACP APS ACS
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**Subtopic ACFT 3.2 - Cruise factors**

ACS ACFT 3.2.1	Integrate the influence of factors affecting aircraft during cruise.	4	Level, cruising speed, wind, mass, cabin pressurisation	APP ACP APS ACS
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**Subtopic ACFT 3.3 - Descent factors**

ACS ACFT 3.3.1	Integrate the influence of factors affecting aircraft during descent.	4	<i>Optional content: wind, speed, rate of descent, cabin pressurisation</i>	ACP ACS
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**Subtopic ACFT 3.4 - Economic factors**

ACS 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 ACS
ACS ACFT 3.4.2	Use continuous climb techniques where applicable.	3		APP ACP APS ACS
ACS ACFT 3.4.3	Use direct routing where applicable.	3		APP ACP APS ACS

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**Subtopic ACFT 3.5 - Environmental factors**

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

ACS 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 ACP APS ACS
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## 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 HUM 1.1.1	Describe the human information processing model.	2	Attention, perception, memory, situational awareness, decision making, response	ALL
ACS 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 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 HUM 2.1.1	State factors that cause fatigue.	1	Shift work <i>Optional content: night shifts and rosters</i>	ALL
ACS 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 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 HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
ACS HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL

#### Subtopic HUM 2.2 - Fitness

ACS HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
ACS 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)

ACS HUM 3.1.1	State the relevance of TRM.	1	<i>Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training</i>	ALL
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ACS 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>				
ACS HUM 3.2.1	Identify reasons for conflict.	3		ALL
ACS HUM 3.2.2	Describe actions to prevent human conflicts.	2	<i>Optional content: TRM team roles</i>	ALL
ACS 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>				
ACS 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 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>				
ACS 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>				
ACS 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 HUM 4.2.2	Respond to stressful situation by offering, asking or accepting assistance.	3	<i>Optional content: The benefits of offering, accepting and asking for help in stressful situations</i>	ALL
ACS HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, Abnormal situations, CISM	ALL
ACS HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
ACS 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

<b>Subtopic HUM 5.1 -Human error</b>				
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ACS 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  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ACS HUM 5.1.2	Differentiate between the types of error.	2	Slips, Lapses, Mistakes  <i>Optional content: Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ACS 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 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 HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ACS HUM 5.1.6	Execute corrective actions.	3	Error compensation  <i>Optional content: ICAO Circular 314 – AN/178 Threat and Error Management (TEM) in Air Traffic Control</i>	ALL
ACS 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 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 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 - COLLABORATIVE WORK</b>				
<b>Subtopic HUM 6.1 - Communication</b>				
ACS HUM 6.1.1	Use communication effectively in ATC.	3		ALL
ACS HUM 6.1.2	Analyse examples of pilot and controller communication for effectiveness.	4		ALL
<b>Subtopic HUM 6.2 - Collaborative work within the same area of</b>				
ACS HUM 6.2.1	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 HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	<i>Optional content: Strips legibility and encoding, labels designation, Feedback</i>	ALL

ACS HUM 6.2.3	List possible actions to provide a safe position handover.	1	<i>Optional content: rigour, preparation, overlap time</i>	ALL
ACS HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
<b>Subtopic HUM 6.3 - Collaborative work between different areas of</b>				
ACS HUM 6.3.1	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 HUM 6.4.1	Describe parameters affecting controller/pilot cooperation.	2	<i>Optional content: workload, mutual knowledge, controller vs pilot mental picture</i>	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

ACS EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, Procedures  <i>Optional content: Frequency selection, Standby equipment</i>	ALL
ACS 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 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 ACP APS ACS

#### Subtopic EQPS 1.2 - Other voice communications

ACS EQPS 1.2.1	Operate landline communications.	3	<i>Optional content: telephone, interphone and intercom equipment</i>	ALL
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### TOPIC EQPS 2 - AUTOMATION IN ATS

#### Subtopic EQPS 2.1 - Aeronautical fixed telecommunication network (AFTN)

ACS EQPS 2.1.1	Decode AFTN messages.	3	<i>Optional content: Movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.</i>	ALL
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#### Subtopic EQPS 2.2 - Automatic data interchange

ACS EQPS 2.2.1	Use automatic data transfer equipment where available.	3	<i>Optional content: Sequencing systems, Automated information and coordination, OLDI</i>	ADV ADI APS ACS
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### TOPIC EQPS 3 - CONTROLLER WORKING POSITION

#### Subtopic EQPS 3.1 - Operation and monitoring of equipment

ACS EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, Responsibilities	ALL
ACS 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, UDF/VDF</i>	ALL
ACS EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL

#### Subtopic EQPS 3.2 - Situation displays and information systems

ACS EQPS 3.2.1	Use situation displays.	3		ALL
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ACS EQPS 3.2.2	Check availability of information material.	3		ALL
ACS EQPS 3.2.3	Obtain information from equipment.	3		APP ACP APS ACS
<b>Subtopic EQPS 3.3 -Flight data systems</b>				
ACS 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 EQPS 3.4.1	Use the ATS surveillance system functions.	3		APS ACS
ACS EQPS 3.4.2	Analyse the information provided by the ATS surveillance system.	4		APS ACS
ACS EQPS 3.4.3	Assign codes.	4		APS ACS
ACS EQPS 3.4.4	Appreciate the use of advanced surveillance technology.	3	<i>Optional content: Mode S, ADS-B, MLAT</i>	APS ACS
<b>Subtopic EQPS 3.5 -Advanced systems</b>				
ACS EQPS 3.5.1	Appreciate the use of controller pilot datalink communications when available.	3		APS ACS
ACS EQPS 3.5.2	Appreciate the use of information provided by advanced systems.	3	<i>Optional content: trajectory-based information, MTCD, MONA, etc.</i>	APS ACS
<b>TOPIC EQPS 4 - FUTURE EQUIPMENT</b>				
<b>Subtopic EQPS 4.1 -New developments</b>				
ACS 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>				
ACS EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
ACS 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 EQPS 5.2.1	Identify that communication equipment has degraded.	3	<i>Optional content: Ground-air and landline communications</i>	APP ACP APS ACS

ACS EQPS 5.2.2	Apply 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 ACP APS ACS
<b>Subtopic EQPS 5.3 - Navigational equipment degradation</b>				
ACS EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	<i>Optional content: VOR, Navigational aids</i>	ALL
ACS EQPS 5.3.2	Apply 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 APP ACP APS ACS
<b>Subtopic EQPS 5.4 - Surveillance equipment degradation</b>				
ACS EQPS 5.4.1	Identify that surveillance equipment has degraded.	3	Partial power failure, Loss of certain facilities, Total failure	APS ACS
ACS 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 ACS
<b>Subtopic EQPS 5.5 - ATC processing system degradation</b>				
ACS EQPS 5.5.1	Identify a processing system degradation.	3	<i>Optional content: FDPS, SDPS, Software processing of situation display</i>	APS ACS
ACS EQPS 5.5.2	Apply contingency procedures in the event of a processing system degradation.	3		APS 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

#### Subtopic PEN 1.1 - Study visit to area control centre

ACS PEN 1.1.1	Appreciate the functions and provision of an operational area control service.	3	study visit to area control centre	ACP ACS
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### TOPIC PEN 2 - AIRSPACE USERS

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

ACS PEN 2.1.1	Characterise civil ATS activities in area control centre.	2	Study visit to an area control centre <i>Optional content: familiarisation visits to TWR, APP, AIS, RCC</i>	ACP ACS
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ACS PEN 2.1.2	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
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#### Subtopic PEN 2.2 - Contributors to military ATS operations

ACS PEN 2.2.1	Characterise military ATS activities.	2	<i>Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units</i>	ALL
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### TOPIC PEN 3 - CUSTOMER RELATIONS

#### Subtopic PEN 3.1 - Provision of services and user requirements

ACS PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
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ACS PEN 3.1.2	Appreciate ATS users requirements.	3		ALL
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### TOPIC PEN 4 - ENVIRONMENTAL PROTECTION

#### Subtopic PEN 4.1 - Environmental protection

ACS PEN 4.1.1	Appreciate the mitigation techniques used en-route to minimise the aviation's impact on the environment.	3	<i>Optional content: FRA, night/weekend routes, ICAO Circular 303 - Operational opportunities to minimize fuel use and reduce emissions</i>	ACP ACS
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## Subject 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop professional attitudes to manage traffic in abnormal and emergency situations.

### TOPIC ABES 1 - ABNORMAL AND EMERGENCY SITUATIONS (ABES)

#### Subtopic ABES 1.1 - Overview of ABES

ACS ABES 1.1.1	List common abnormal and emergency situations.	1	<i>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</i>	ALL
ACS ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
ACS ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	<i>Optional content: ICAO Doc 4444</i>	APP ACP APS ACS
ACS ABES 1.1.4	Take into account that procedures don't exist for all abnormal and emergency situations.	2	<i>Optional content: real life examples</i>	ALL
ACS ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	<i>Optional content: Separation, Information, Coordination</i>	ALL

### TOPIC ABES 2 - SKILLS IMPROVEMENT

#### Subtopic ABES 2.1 - Communication effectiveness

ACS 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 ABES 2.1.2	Apply change of radiotelephony call sign.	3	ICAO Doc 4444	ALL

#### Subtopic ABES 2.2 - Avoidance of mental overload

ACS ABES 2.2.1	Describe actions to keep the control of the situation.	2	<i>Optional content: sector splitting, holding, flow management, task delegation</i>	ALL
ACS ABES 2.2.2	Organise priority of actions.	4		ALL
ACS 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 ABES 2.2.4	Consider asking for help.	2		ALL

#### Subtopic ABES 2.3 - Air / ground cooperation

ACS ABES 2.3.1	Collect appropriate information relevant for the situation.	3		ALL
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ACS ABES 2.3.2	Assist the pilot.	3	Pilot workload <i>Optional content: Instructions, information, support, human factors, etc.</i>	ALL
<b>TOPIC ABES 3 - PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS</b>				
<b>Subtopic ABES 3.1 - Application of procedures for ABES</b>				
ACS ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	<i>Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground based safety nets alerts, airframe failure</i>	ALL
<b>Subtopic ABES 3.2 - Radio failure</b>				
ACS ABES 3.2.1	Describe the procedures followed by a pilot when he/she experiences complete or partial radio failure.	2	ICAO Doc 7030 <i>Optional content: military procedures</i>	ALL
ACS 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 ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3	ICAO Doc 4444	ALL
<b>Subtopic ABES 3.4 - Strayed or unidentified aircraft</b>				
ACS ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	ICAO Doc 4444 <i>Optional content: Inside controlled airspace, Outside controlled airspace</i>	ALL
ACS 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 ABES 3.5.1	Provide navigational assistance to diverting emergency aircraft.	4	Track/heading, Distance, Other navigational assistance <i>Optional content: Nearest most suitable aerodrome</i>	APP ACP APS ACS
<b>Subtopic ABES 3.6 - Transponder failure</b>				
ACS ABES 3.6.1	Apply procedures in the event of an SSR transponder failure.	3	ICAO Doc 4444, ICAO Doc 7030 <i>Optional content: total/partial failure, impact on ADS-B/Mode S capability</i>	APS 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 related subject objective.
  - iii. Subjects, topics and sub-topics are contained in Appendix 9 to Regulation (EU) No .../... (Reference to ATCO.D.010(a)(2)(vi) Area Control Surveillance Rating — ACS), and are repeated in this AMC to provide the reader with a comprehensive and unique reference document. Subject objectives and training objectives are included in and form integral part of this AMC.

<b>Subject 4 : METEOROLOGY</b>			<b>Subject</b>
<b>TOPIC MET 1 METEOROLOGICAL PHENOMENA</b>			<b>Topic</b>
<b>Sub-topic MET 1.1 - Meteorological phenomena</b>			<b>Sub -topic</b>
ACS (RAD) MET 1.1.1	Appreciate the impact of adverse weather.	3	Thunderstorms, Icing, Jetstreams, Clear Air Turbulence (CAT), Turbulence, Microburst, Severe mountain waves, Line squalls <i>Optional content: Volcanic ash, Solar radiation</i>
ACS (RAD) MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	<i>Optional content: Separation, holding, diversions, re-routings, etc</i>
ACS (RAD) MET 1.1.3	Integrate data about meteorological phenomena into clearances, instructions and transmitted information.	4	<i>Optional content: Thunderstorm, Turbulence, Icing, Volcanic ash</i>

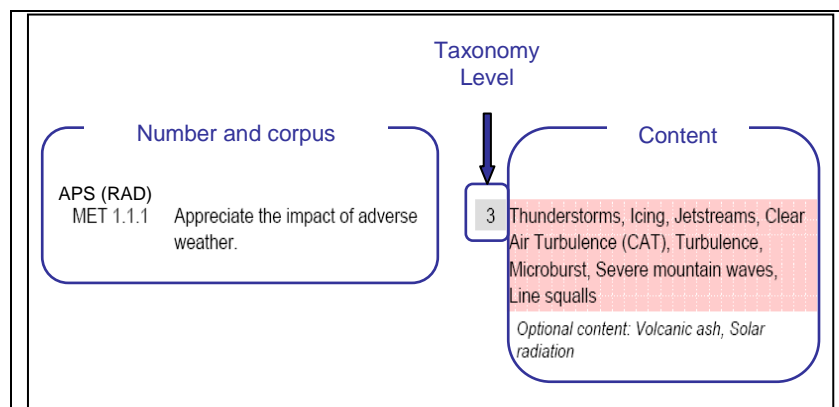
**Figure 1: Layout of syllabus**

- 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 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 APS
APS MET 1.1.2	Integrate data about meteorological phenomena into provision of ATS.	4	clearances, instructions and transmitted information <i>Optional content: relevant meteorological phenomena</i>	ALL
APS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS 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 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 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	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. 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 Calculate conversions between the three north designations.
<b>Check</b>	Make sure the information is correct (satisfactory)	Check the accuracy of flight data information Check availability of information material.
<b>Choose</b>	Select out of number, decide to do one thing rather than another	Choose appropriate levels. 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

<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
		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. 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. 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 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 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. Respond to distress and urgency messages and signals.
<b>Scan</b>	Continuously observe rapidly, sequentially and selectively in order to	Scan data display

<b>L3 Verb</b>	<b>Definition</b>	<b>Example</b>
	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. 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.

<b>L4 Verb</b>	<b>Definition</b>	<b>Example</b>
<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. 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. 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.

<b>L4 Verb</b>	<b>Definition</b>	<b>Example</b>
	parts	
<b>Manage</b>	Handle, wield, conduct	Manage traffic on the manoeuvring area. 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. 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. 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.

<b>L5 verb</b>	<b>Definition</b>	<b>Example</b>
<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.
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## 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