EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION

EUROCONTROL

Guidelines for ATCO Common Core Content Initial Training

T14

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EUROPEAN AIR TRAFFIC MANAGEMENT

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Abstract

This document provides guidelines for common core content with training objectives for controller initial training (Basic and Rating training).

It includes nine modules: one corresponds to the Basic training, while the eight others correspond to the ratings and endorsements contained in the 'European Manual of Personnel Licensing - Air Traffic Controllers', edition 2.0 (see EATM, 2004a – L1).

The current document, referred to as **T14, edition 2.0**, results from the revision and merge of the following two documents:

- the 'Guidelines for Common Core Content and Training Objectives for Air Traffic Controllers Training (Phase I - Revised)', referred to as **T3, edition 2.0 dated 2001** (edition 1.0 was published in 1996);
- the 'Guidelines for Common Core Content and Training Objectives for Air Traffic Controllers Training (Phase II)', corresponding to **first edition of T14, published in 2000**.

This second edition of T14 supersedes any previous version of both T3 and T14.

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DOCUMENT APPROVAL

The following table identifies all management authorities who have successively approved the present issue of this document.

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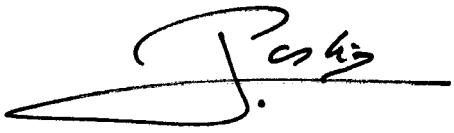
Chairman HRT Training Focus Group (TFG)	 M. PISTRE	13.01.05
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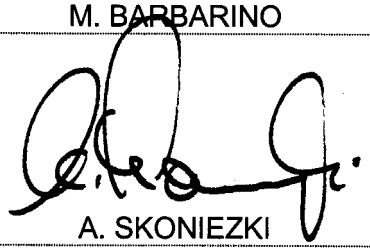
Chairman EATM Human Resources Team / Programme Steering Group (HRT/PSG)	 A. SKONIEZKI	13.01.05
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DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITION NUMBER	EDITION DATE	INFOCENTRE REFERENCE	REASON FOR CHANGE	PAGES AFFECTED
1.0	20.07.2000		First Edition - Released Issue	All
1.1	06.06.2004		Second Edition – Draft for TFG21 (merge of T14 and T3 data)	All
1.2	04.10.2004		Second Edition – Proposed Issue for HRT22 (basic document configuration and editorial changes)	All
2.0	10.12.2004	041202-01	Second Edition – Released Issue (agreed on 12-13 Oct-04) (exportation of data from former to current version of EATM document template + fixing of style alterations due to exportation + basic layout and editorial adjustments)	All

CONTENTS

EXECUTIVE SUMMARY

The "EUROCONTROL Safety Regulatory Requirement on ATM Services' Personnel" edition 2 (ESARR5 – see SRC [2002]), requires *initial ATC training courses to satisfy, as a minimum, the ECAC guidelines for Common Core training*. The purpose of this document is to specify this minimum.

The current document, referred to as **T14, edition 2.0**, results from the revision and merge of the following two documents:

- the 'Guidelines for Common Core Content and Training Objectives for Air Traffic Controllers Training (Phase I - Revised)', referred to as **T3, edition 2.0 dated 2001** (edition 1.0 was published in 1996);

- the 'Guidelines for Common Core Content and Training Objectives for Air Traffic Controllers Training (Phase II)', corresponding to **first edition of T14, published in 2000**.

This second edition of T14 supersedes any previous version of both T3 and T14.

The present document is the result of a revision recommended by Training Focus Group (TFG) and Human Resources Team (HRT) in order to:

- upgrade the technical references when a major change occurred since the last edition (i.e. ICAO Doc 4444);

- ensure complete consistency between modules;

- correct misleading wording and typing.

The upgrade makes use of the feedback received to improve the document's readability. There is no significant change in terms of training requirements between this version and the previous ones. Some historical background (such as the working process) is not mentioned any more.

As in the previous versions, the common core content and training objectives listed in the document are designed in such a manner as to be usable either by a training centre which is just beginning to become involved in a given training, or by the established centres as a complementary document to crosscheck their own training content.

These guidelines are structured in three parts:

- Part 1, 'Principles', contains information on the document policy and background, and a methodology to use these guidelines;

- Part 2, 'Basic Training', provides the Basic training course syllabus, including the objectives;

- Part 3 'Rating Training', provides the Rating training course syllabus, including the objectives. The syllabus is made of eight modules corresponding to the rating and endorsements proposed in the 'European Manual of Personnel Licensing – Air Traffic Controllers' (see EATM, 2004a – L1).

References and further reading, abbreviations and acronyms used in this publication, and a list of the contributors complete the document.

PART 1: PRINCIPLES

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1. INTRODUCTION

The European Civil Aviation Conference (ECAC) Strategy for the nineties called for the definition of guidelines for the selection, training and licensing of Air Traffic Services (ATS) staff in the ECAC Member States.

The Human Resources Team (HRT), within the European Air Traffic Control Harmonisation and Integration Programme (EATCHIP), which has later become the European Air Traffic Management Programme (EATMP) and is now known simply as European Air Traffic Management (EATM), established through its Training Sub-Group (TSG), now known as the Training Focus Group (TFG), the Task Force Common Core Content (TF-CCC) to design a set of common core contents for Air Traffic Controller (ATCO) training.

The TF-CCC was created to establish standards for common core training of ATCOs, together with training objectives and syllabi for ATCO training, from entry to licence standard.

More information on the principles can be found in EUROCONTROL's EATM document referred to as T38, 'EATM Training Progression and Concepts' (see EATM, 2004b), on which these specifications are based.

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2. TERMS OF REFERENCE OF TF-CCC

In 2004 the TFG proposed HRT to extend the TF-CCC with appropriate Terms of Reference (TORs) in order to review the CCC.

Full Task Force Name:	**TASK FORCE COMMON CORE CONTENT**		
Acronym: (as in COFM)	**TF-CCC**	Associated Domain:	**HUM**

Associated Sub-Group:	**TRAINING FOCUS GROUP (TFG)**
Associated Group:	**HUMAN RESOURCES TEAM (HRT)**
Associated Programme/Service:	**HUMAN FACTORS DOMAIN**

Re-activation date:	**01.01.2004**	End date: (if relevant)	**31.12.2004**

Chair person:	**M. PISTRE**	Secretary:	**TBD**
Unit:	**IANS/TDH**	Unit:	**IANS/TDH**
TOR approved by:	**TRAINING FOCUS GROUP (TFG)**	Date:	**10.12.2003**

TERMS OF REFERENCE

1. Mission

The Task Force is to review the ATCO Common Core Content (CCC).

2. Authority

The TF-CCC reports to the Training Focus Group (TFG).

3. Participation

Agency staff: IANS/TDH training experts and ATM experts.

ECAC Members: ATC training experts from ECAC STATES

Non-ECAC Members: N/A

Observers: N/A

4. Tasks

The Task Force shall:

- complete the review started in 2003 and to be finished in 2004,
- liaise with the User Groups dealing with the implementation of the CCC.

5. Occurrence of this WG per year

The Working Group will:

- make an extensive use of the OneSky Team 'CCC Training' for exchange of information, discussions and Internet meeting. The maximum number of face-to-face meetings will be three times in 2004.

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3. SCOPE OF THE DOCUMENT

ATCO training is divided into four phases, which are defined in this section. This document deals with the first phase: Initial Training.

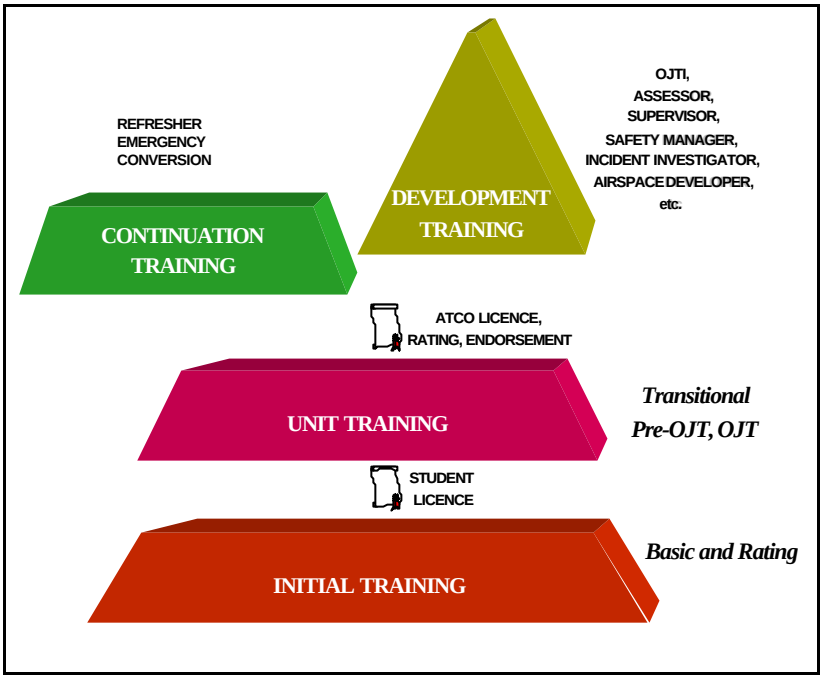

Figure 1: Progression of ATCO training

3.1 Initial Training

Training including theory, part-task practice and simulation. The object of initial training is to prepare an *ab initio* for training at an Air Traffic Control (ATC) unit. It includes two phases (basic and rating training) leading to a student licence: Rating training might also be provided as training for conversion to another rating.

3.1.1 Basic training

Training designed to impart fundamental knowledge and skills to enable an *ab initio* to progress to specialised ATC training.

3.1.2 Rating training (training in the rating discipline)

Specialised ATC training to provide knowledge and skills related to a job category and appropriate to the discipline to be pursued in the ATS environment.

3.2 Unit Training

Training comprising transitional training, pre-OJT and OJT, leading a learner to obtaining an air traffic controller licence, with appropriate rating and with appropriate rating endorsements and unit endorsements:

3.2.1 Transitional training

Phase following initial training during which site-specific theoretical knowledge and understanding will be transferred to the student air traffic controller and/or trainee air traffic controller using a variety of methods and during which skills will be developed through the use of site-specific simulations.

3.2.2 Pre-On-the-Job Training (Pre-OJT)

Phase of locally based training during which extensive use of simulation using site-specific facilities will enhance the development of previously acquired routines and abilities to an exceptionally high level of achievement.

3.2.3 On-the-Job Training (OJT)

The integration in practice of previously acquired job-related routines and skills under the supervision of a qualified On-the-Job-Training Instructor (OJTI) in a live traffic situation.

3.3 Continuation Training

Training given to licensed or certificated personnel designed to augment existing knowledge and skills. It includes refresher, emergency and conversion training.

3.3.1 Refresher training

Refresher training is designed to review, reinforce or upgrade existing knowledge and skills (including team skills).

3.3.2 Emergency training

Training that shall be given to all controllers on a regular basis. It includes training in emergencies, in unusual situations and in degraded systems. Most of this training will be site-specific:

Emergency

A serious, unexpected and often dangerous situation requiring immediate action.

Unusual situation

A set of circumstances which are neither habitually nor commonly experienced. The essential difference with an emergency is that the element of danger or serious risk is not necessarily present in an unusual situation.

Degraded systems

Unusual situations that are the result of a system failure or malfunction.

3.3.3 Conversion training

Training designed to provide knowledge and skills appropriate to a change in either job category (new rating discipline, rating endorsement or unit endorsement), environment (new procedures) or system (system upgrade or change).

3.4 Development Training

Training designed to provide additional knowledge and skills demanded by a change in job profile, e.g. new licence endorsement (OJTI) or any other career development like assessor, supervisor, safety manager, incident investigator, airspace developer, training manager, traffic flow manager, etc.

3.5 Denomination of the Learner

'Learner' is the generic term for the person performing a learning activity without any reference to his/her statute.

In the case of ATCO training, the specific names according to the training phase are:

- participants to initial training are called *'ab initio'* as they do not hold a student licence;
- participants to unit training are called 'student air traffic controllers' when they hold a student air traffic controller licence and 'trainees' when they hold an ATC licence;
- participants to continuation training or development training are called 'trainees' as they hold an ATC licence.

Note: The scheme and definitions apply in a simple way to a learner entering the system. In the cases of conversion or of multiple rating training, the scheme is more complex.

When the learner is converting from one rating to another, he/she will be enrolled in rating training when he/she already holds an ATC licence, so he/she will be a trainee. This rating training is considered as conversion and not as initial training.

When the learner is enrolled in an additional rating training after having successfully completed one rating training, he/she already holds a student licence and no ATC licence, so he/she will be a student.

For simplification purposes 'learner' will be systematically used.

3.6 Language Proficiency

The reader should note that, although language proficiency is a prerequisite to licensing and is included in ICAO Annex 1, the subject has not been addressed in the CCC.

The current situation in terms of entry level and in terms of linguistic environment varies so much between the different Member States that a common core seemed difficult to establish.

4. COMPREHENSIVE DEFINITION AND USE OF TRAINING OBJECTIVES

A training objective is a description of what is expected of a learner after training. The description is accurate and measurable.

4.1 Description and Categorisation of the Objectives

In EATM training documentation we refer to several categories of objectives. (See document T38, 'EATM Training Progression and Concepts' - EATM [2004b]).

- **Objective:** A clear statement based on a corpus, level and content.

  The **corpus** is a description of the learner performance. It always includes an action verb to ensure that the outcome is observable. The action verb is stated according to a defined taxonomy.

  The **level** highlights numerically the taxonomy level of the action verb.

  The **content** may be implicit or explicit and this concept will be explained below.

- **General objective** (or goal): Describes the direction to move in rather than a detailed quantitative objective.

- **Performance objective:** A clear and unambiguous statement of what a learner is expected to do (behaviour or **Performance**) with the minimum level of acceptable performance (**Standard** in terms of quality, quantity and time allowed for completion) and conditions under which the performance is to be carried out (**Conditions**). The performance objective clearly establishes a link between the training objective and the method to assess if this training objective has been reached.

In this document we restrict our scope to the level of general objective and objective.

4.1.1 Corpus

The corpus is a description of the learner performance. Where possible, objectives relate to single activities.

Thus:

*'The learner shall organise traffic to take account of airspace boundaries **and** areas of responsibility'*.

would become:

'The learner shall organise traffic to take account of airspace boundaries'. *'The learner shall organise traffic to take account of areas of responsibility'*.

The performance, linked to the task analysis, is essential and is not subject to frequent change.

4.1.2 Content

The content illustrates and details the performance. It may be subject to more frequent changes than the corpus, due to technical and operational evolution.

The content may be composed of two parts – implicit and explicit. The explicit content is what is written in the content field proper to the objective, while the implicit content is not written in the content field of each objective but rather implied in the corpus of the objective and other elements (module, subject, etc.).

For example, the objective level 3 ATM1.2.3. including the corpus 'use radar for the provision of flight information service' and the content 'ICAO Doc 4444; information to identified aircraft concerning: traffic, navigation, e.g. weather', is found in ACS, APS, TCL and ADI/RAD. It is clear that the operation will be completely different in these four different contexts

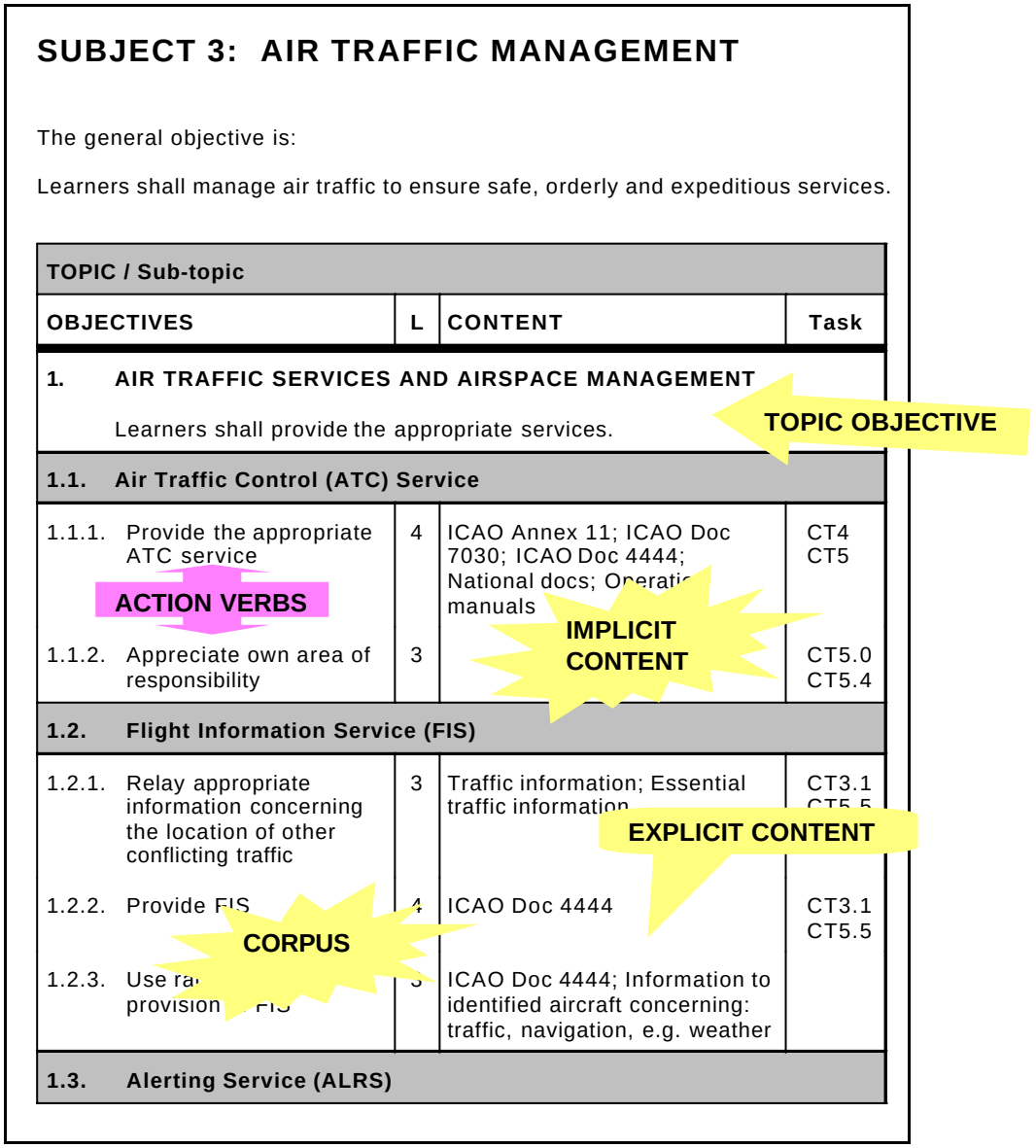

Figure 2: CCC objectives terminology

Some conventions are applied to the wording of the explicit content:

- When the items are in a list, each of them is to be addressed. (According to the basic principles of CCC, local items may however be added subject to local training designer judgement.)

- When the items are in a list and terminated by **etc.**, each of them is to be addressed; and it is indicated to the training designer that additional items are foreseen but not of common interest all over the ECAC area.

- In a list, items following **e.g.** are optional. (These are more an illustration of the performance than a detailed specification.)

Even when all of the items are optional the objective has to be performed according to the action verb included.

For example an ATM objective is:

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
6.5. Radar Separation			
6.5.3. Provide radar separation by practising radar vectoring in a variety of situations	4	e.g. transit, meteorological phenomena, vectoring for approach, departure vs transit vs. arrival	

The list of situations is preceded by e.g. This statement enables flexibility for the choice of the situations but does not intend to minimise the performance of radar vectoring.

4.1.3 References

Whenever an objective, or its content, refers to ICAO Standards And Recommended Practices (SARPs), users should take care to use the most recent version of the referenced document(s) or its part.

If an objective or its content refers to National regulations or practices different from ICAO, only those notified to ICAO (SARPs) or published in National AIP (PANS) should be used.

4.2 Organisation of the Objectives

Basic and rating training modules are divided into **subjects**, which are divided into **topics** that are in turn subdivided into **sub-topics**. This structure is used to create and classify the objectives: one general objective is linked to each subject and one or several objectives are linked to each sub-topic. Optionally a main objective is linked to a topic.

Objectives are assigned to the specific subject which deals with the knowledge fundamentally needed to accomplish the performance.

Topics, sub-topics and objectives are organised and sequenced within each subject in order to facilitate the analysis of the document. One main purpose is to make visible the commonalities and differences between the modules. This clustering is not a structured organisation of the training, in particular, it is not a chronological sequence. It is not an organisation of the instructor duties. CCC structure does not dictate organisation of training provision.

If more than one subject contributes to a given objective, this objective is assigned to the most contributing subject. When ATM is among the subjects, the objective is usually assigned to ATM

4.3 Repetitions of Objectives in the Modules

All the objectives appearing in a rating training module are implicitly appropriate to this module. As a consequence, objectives may be repeated 'verbatim' in different modules and nevertheless specify a different performance. The reader always needs to mentally add the sentence 'in this rating training module 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 modules but is different because the context is different in each rating training module (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).

This rule also applies to the non-duplication of objectives between Basic and Rating training.

The objectives of the Basic course are a prerequisite for the objectives of the Rating training courses. Accordingly the objectives of the Basic course are not repeated in the Rating training modules if there is no additional performance or additional content or significant difference in the implicit content.

For example:

The objective 'Explain the need of approved phraseology' is included in the Basic training and will not be repeated in the Rating training because the reasons why approved phraseology is needed do not vary.

The objective 'use approved phraseology' is included in the Basic training and is repeated in the Rating training because the context is different in each Rating training module.

5. HOW TO USE THIS DOCUMENT

5.1 Document Structure

It is necessary to read thoroughly Part 1 of the document before moving to the following parts. Fundamental principles for using Part 2, 'Basic Training', and Part 3, 'Rating Training', are indeed found in Part 1, or in the listed reference documents.

Part 2 describes the Basic training, while Part 3 consists of the following eight modules that are allocated to the Ratings of the classes notified in ESARR5 Edition 2 (see SRC, 2002):

AERODROME	**ADV**:	Aerodrome Control Visual Rating
	ADI:	Aerodrome Control Instrument Rating - includes Visual
	ADI/RAD:	Aerodrome Radar Control Endorsement
PROCEDURAL	**APP**:	Approach Control Procedural Rating
	ACP:	Area Control Procedural Rating
SURVEILLANCE	**APS**:	Approach Control Surveillance Rating with Radar Endorsement
	ACS:	Area Control Surveillance Rating with Radar Endorsement
	TCL:	Terminal Control Endorsement

5.2 Document Layout

Each module is subdivided into subjects. The subject is shown as the header of a table. The general objective is attached to this header.

The topics are laid down in rows, which include the corresponding main objective.

Objectives and contents are laid out in columns:

- the first column shows the objective number and corpus;
- the second column shows the taxonomy level;
- the third column shows the objective content (in some cases there is no explicit content as the objective is deemed to be self-explanatory);

- the last column, where used, indicates whether the objective meets a Core Task (CT), Direct Support Task (DST) or Indirect Support Task (IST). These tasks are derived from the Cognitive Task Analysis (approach & area Ratings only) which is included in Part 3, Section 7 of this document.

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The general objective is:

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

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. AIR TRAFFIC SERVICES AND AIRSPACE MANAGEMENT Learners shall provide the appropriate services.			
1.1. Air Traffic Control (ATC) Service			
1.1.1. Provide the appropriate ATC service	4	ICAO Annex 11; ICAO Doc 7030; ICAO Doc 4444; National docs; Operation manuals	CT4 CT5
1.1.2. Appreciate own area of responsibility	3		CT5.0 CT5.4
1.2. Flight Information Service (FIS)			
1.2.1. Relay appropriate information concerning the location of other conflicting traffic	3	Traffic information; Essential traffic information	CT3.1 CT5.5
1.2.2. Provide FIS	4	ICAO Doc 4444	CT3.1 CT5.5
1.2.3. Use radar for the provision of FIS	3	ICAO Doc 4444; Information to identified aircraft concerning: traffic, navigation, e.g. weather	
1.3. Alerting Service (ALRS)			

Figure 3: CCC columns layout

5.3 Notion of Implicit Content and Context

As mentioned in the objective definitions, all the objectives that appear in a Rating training module are implicitly appropriate to this module.

As a consequence, some objectives are repeated in all modules but not common to all modules, because their context differ.

Repeated qualifies the link between two objectives when the explicit elements (level, corpus, content) are verbatim. However, the context of the rating training module being different, the objective needs to be fulfilled twice in the different context.

*Example**:** ATM objective level 3:*

2.1.	**Effective Communication**		
2.1.1.	Use approved phraseology	3	ICAO Doc 4444 Chapter 12, ICAO Doc 9432 RTF Manual; Standard words and phrases as contained in ICAO Annex 10 Vol 2 Chapter 5; National phraseology

This objective is identical in APP and ACS but needs to be fulfilled in both contexts.

Common qualifies the link between two objectives when the explicit elements (level, corpus, content) are identical and when the context of the rating training module is indifferent to the performance. The objective does not need to be fulfilled twice in the different context.

Example: HUM Objective level 2:

4.2.	**Verbal/non-verbal Communication**		
4.2.3.	Characterise non-verbal communication	2	e.g. Body language; Facial expressions

This objective needs only to be fulfilled once.

(A practical way to differentiate between repeated and common objectives is as follows: when a training designer is planning the implementation of the training, he/she needs to plan two different training events for repeated objectives and one single training event for common objectives.)

In order to enable a training designer working on a single module to build up this module without referring to another one, the objectives have been repeated in every module.

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PART 2: BASIC TRAINING - OBJECTIVES AND SYLLABUS

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CONTENTS

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EXECUTIVE SUMMARY

Basic training course is defined as ***training designed to impart fundamental knowledge and skills to enable an ab initio to progress to specialised ATC training***.

It is defined as a prerequisite to any Rating training.

The composition and topics were chosen based on the ICAO Annex 1 requirements for Controller licensing, namely:

- Air Law (including Rules of the Air, National and International regulations and organisational structures) renamed 'Aviation Law',
- Air Traffic Control (ATC) Equipment (including modern systems and computers in general) renamed 'Equipment and Systems',
- Principles of Flight (including aircraft operations and functions, power plants and performance characteristics) renamed 'Aircraft',
- Human Performance renamed 'Human Factors',
- Language;
- Meteorology,
- Navigation,
- Operational Procedures renamed 'Air Traffic Management',
- Miscellaneous renamed 'Professional Environment'.

The taxonomy level does not go higher than three different grades, namely:

- level 1: 'to know',
- level 2: 'to understand',
- level 3: 'to apply'.

(Note a few objectives at level 0: 'to be aware of'.)

Even at Basic level the training is based on the principle of learning by doing: objectives requiring the application of knowledge learned were included as appropriate to consolidate this knowledge. This resulted in the regular use in the objectives of action verbs such as 'choose', 'issue', 'use' and 'apply'.

When teaching to the training objectives, it is envisaged that different training methodologies will be used. No recommendation is made in this area, the pertinent document being the Training Plans.

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SUBJECT 1: INTRODUCTION TO THE COURSE

The general objective is:

Students shall describe the training programme that they will follow, the potential for development of their careers in ATC and state the rules and regulations concerning employment and security.

TOPIC / Sub-topic		
OBJECTIVES	**L**	**CONTENT**
1. COURSE MANAGEMENT Learners shall explain the aims and objectives of the course, the management structure and recognise the materials to be used.		
1.1. Course Introduction		
1.1.1. Explain the basic course, the aims and main objectives of the course	2	Course objectives
1.2. Course Administration		
1.2.1. State the course administration	1	
1.3. Study Material and Training Documentation		
1.3.1. Use the appropriate documentation for the course	3	e.g. Training documentation, library; CBT library, Web access
2. INTRODUCTION TO THE ATC TRAINING COURSE Learners shall state the methodology and describe the assessment procedures used in the course.		
2.1. Course Content		
2.1.1. State the different methods of teaching the subjects	1	Theoretical training; Practical training; Self-study; Taxonomy; Action verbs
2.1.2. Describe, in general terms, the content of the subjects	2	Aviation law, air traffic management, meteorology, navigation, aircraft, human factors, equipment and systems, professional environment, e.g. language
2.2. Training Progress		
2.2.1. Recognise the feedback mechanisms available	1	e.g. Instructor discussions; Training progress; Assessment; Results; Briefing; Debriefing
2.3. The Assessment Process		
2.3.1. Describe the assessment process	2	The assessment process, including continuous assessment, applied during the course and associated re-sit procedures

TOPIC / Sub-topic		
OBJECTIVES	**L**	**CONTENT**
3. INTRODUCTION TO THE ATCO'S FUTURE		
3.1. Job Prospects		
3.1.1. Recognise an ATCO's working environment	1	Area control unit, approach control unit, aerodrome control unit
3.1.2. Recognise career developments	1	e.g. OJTI, supervisor, operational managerial posts, non-operational posts
4. CONDITIONS OF SERVICE		
4.1. Current Conditions of Employment		
4.1.1. Take account of administrative employment rules and regulations that apply to a student	2	
4.1.2. Take account of administrative employment rules and regulations that apply to an ATCO as an employee	2	
4.1.3. State the licensing/certification system of the country	1	
4.2. Negotiations and Policies		
4.2.1. Recognise the management/staff negotiation and discussion procedures	1	
4.2.2. Recognise the roles of trade unions, other ATC associations and professional organisations	1	
5. SECURITY		
5.1. Security		
5.1.1. Define security and safety	1	
5.1.2. State the rules and regulations concerning the security at a facility and within ATC	1	

SUBJECT 2: AVIATION LAW

The general objective is:

Students shall apply the regulations governing Rules of the Air, airspace and flight planning and explain their development and incorporation into National legislation.

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. INTRODUCTION			
1.1. National and International Organisations			
1.1.1. Name the key National and International aviation organisations	1	e.g. ICAO, ECAC, JAA, EUROCONTROL, National Authority	
1.1.2. Describe the impact these organisations have on ATC and their interaction with each other	2		
1.1.3. State the necessity for air law, the sources and development of aviation law	1	e.g. ICAO Annex 2, National Aviation Law	
1.2. ATC Licensing/Certification			
1.2.1. Explain the ATC licensing/certification process	2	ESARR 5; Approved training courses, ATC ratings and endorsements e.g. National documents, European Manual of Personnel Licensing - Air Traffic Controllers	
1.2.2. Explain the privileges and limitations of controller licences	2	e.g. Qualification, validation, minimum experience, training and medical requirements, competency checks	
1.3. Safety Regulation			
1.3.1. Describe the need for safety regulation	2	e.g. SRC Policy Doc 3, National documentation	
1.3.2. Explain how a safety management system complies with regulatory requirements	2	ESARR 3	
1.3.3. Describe the safety organisation	2	Safety policy (ESARR 3)	
1.3.4. Explain the impact of safety regulation on the controller	2	ESARR 5	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
2. INTERNATIONAL ORGANISATIONS			
2.1. ICAO			
2.1.1. Explain the purpose and function of ICAO	2		
2.1.2. Describe the methods by which ICAO notifies and implements legislation	2	e.g. SARPs, PANS, ICAO Annexes, ICAO Documents, regional offices	
2.2. Other Agencies			
2.2.1. Describe the purpose and function of other International agencies and their relevance to air traffic operations	2	e.g. ECAC, EU, JAA, ITU, EUROCONTROL, SRC/SRU	
2.3. Aviation Associations			
2.3.1. Describe the purpose of controller, pilot, airline and airspace user associations and their interaction with ATC	2	e.g. IFATCA, IFALPA, IATA, AEA, IAOPA, IACA, military services	
3. NATIONAL ORGANISATIONS			
3.1. General			
3.1.1. Describe the purpose and function of appropriate National agencies and their relevance to air traffic operations	2	e.g. Civil aviation administration agencies, government agencies	
3.2. National Legislative Procedures			
3.2.1. Describe the methods by which legislation is implemented and notified	2	e.g. ICAO Annex 15, AIS, AIPs, AICs, NOTAMs, integrated aeronautical information package, National legislation, LOAs, operations manual	
3.3. National Regulatory Body			
3.3.1. Name the body responsible for licensing and enforcing legislation and operational procedures	1		
3.3.2. Describe how the regulatory body carries out its safety regulation responsibilities	2		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
3.4. National Aviation Associations			
3.4.1. Describe the purpose of National controller, pilot, airline and airspace user associations and their interaction with ATC	2		
4. RULES AND REGULATIONS			
4.1. General			
4.1.1. Differentiate between the Air Navigation Services	2	ICAO Doc 9161	
4.1.2. Explain the considerations which determine the need for the ATS	2	ICAO Annex 11 Chapter 2	
4.1.3. Differentiate between the ATS	2	ATCS, ADVS, FIS, ALRS	
4.2. Airspace			
4.2.1. Explain airspace classification	2	ICAO Classes A-G, ICAO Annex 11 Chapter 2 National classification	
4.2.2. Differentiate between the different types of airspace	2	e.g. Control zones, control areas, airways, upper and lower airspace, restricted areas, prohibited and danger areas, FIR, aerodrome traffic zone, etc.	
4.2.3. Decode information from aeronautical charts	3	e.g. Control zones, control areas, airways, upper and lower airspace, restricted areas, prohibited and danger areas, FIR, aerodrome traffic zone, etc.	
4.3. Rules of the Air			
4.3.1. Explain the Rules of the Air	2	ICAO Annex 2 Chapter 3	
4.3.2. Appreciate any notified National differences with ICAO	3	National legislation	
4.3.3. Appreciate the influence of relevant flight rules on ATC	3	General flight rules, instrument flight rules, visual flight rules	
4.3.4. Appreciate the differences between flying in accordance with VFR and IFR, in VMC and IMC	3	ICAO Annex 2 Chapters 4 and 5	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
4.4. Flight Plans			
4.4.1. Explain the functions of a flight plan	2		
4.4.2. Explain the different types of flight plan	2		
4.4.3. Encode and decode flight plans (including supplementary information)	3	ICAO form, AFTN format, National differences	
4.4.4. Encode and decode an appropriate selection of standard ICAO abbreviations	3	ICAO Doc 8585, ICAO Doc 8643, ICAO Doc 7910	
4.4.5. Describe flight plan processing	2	e.g. AFTN, IFPS	
4.4.6. Describe any additional National procedures for flight plans	2		
4.5. Units of Measurement			
4.5.1. Describe the units of measurement used in aviation	2	ICAO Annex 5 National procedures	

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The general objective is:

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

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. AIR TRAFFIC MANAGEMENT			
1.1. Units of Measurement			
1.1.1. Apply the units of measurement appropriate to ATM	3		
1.2. Air Traffic Control (ATC) Service			
1.2.1. Define ATC service	1	ICAO Annex 11 Chapter 1, definitions	
1.2.2. Explain the division of the ATC service	2	ICAO Annex 11	
1.2.3. Explain the responsibility for the provision of the ATC service	2	ICAO Annex 11	
1.2.4. Differentiate between the different methods of ATC service	2	Surveillance, procedural	
1.3. Flight Information Service (FIS)			
1.3.1. Define FIS	1	ICAO Annex 11 Chapter 1	
1.3.2. Describe the scope of the FIS	2	ICAO Annex 11 Chapter 4	
1.3.3. Explain the responsibility for the provision of the FIS	2	ICAO Doc 4444 Chapter 9	
1.3.4. State the methods of transmitting information	1	e.g. RTF, datalink, ATIS, VOLMET, etc.	
1.3.5. Issue information to aircraft	3	e.g. SIGMET, serviceability of NAVAIDs, weather, flight safety information, etc.	
1.4. Alerting Service (ALRS)			
1.4.1. Define ALRS	1	ICAO Annex 11 Chapter 1	
1.4.2. Describe the scope of the ALRS	2	ICAO Annex 11	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1.4.3. Explain the responsibility for the provision of the ALRS	2	ICAO Doc 4444 Chapter 9	
1.4.4. Differentiate between the phases of emergency	2	Uncertainty, alert, distress	
1.4.5. Describe the organisation of an ALRS	2	Responsibilities, local organisation	
1.4.6. Describe the cooperation between units providing the alerting services and the SAR units	2		
1.4.7. Differentiate between distress and urgency signals	2	e.g. Mayday, Pan, visual signals, etc.	
1.5. Air Traffic Flow Management (ATFM)			
1.5.1. Define ATFM	1		
1.5.2. Describe the scope of ATFM	2	ICAO Doc 4444 Chapter 3	
1.5.3. Explain the responsibility for the provision of ATFM	2	ICAO Doc 4444 Chapter 3	
1.5.4. State the methods of providing ATFM	1	ICAO Doc 4444 Chapter 3	
1.6. Airspace Management (ASM)			
1.6.1. Define ASM	1	EUROCONTROL ASM HBK - Airspace Management Handbook for the application of FUA	
1.6.2. Describe the scope of ASM	2	EUROCONTROL ASM HBK - Airspace Management Handbook for the application of FUA	
1.6.3. Explain the responsibility for the provision of ASM	2	EUROCONTROL ASM HBK - Airspace Management Handbook for the application of FUA	
1.6.4. State the methods of managing airspace	1	e.g. FUA, airspace design	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
2. RADIOTELEPHONY (RTF)			
2.1. RTF General Operating Procedures			
2.1.1. Explain the need for approved phraseology	2	ICAO Doc 4444 Chapter 12, National documents, ICAO Doc 9432 RTF manual, standard words and phrases as contained in ICAO Annex 10 Vol 2 Chapter 5	
2.1.2. Use approved phraseology	3	ICAO Doc 4444 Chapter 12, National documents, ICAO Doc 9432 RTF manual, standard words and phrases as contained in ICAO Annex 10 Vol 2 Chapter 5	
2.1.3. Perform communication effectively	3	Transmission techniques, ICAO Annex 1 Language Proficiency	
3. ATC CLEARANCES AND ATC INSTRUCTIONS Learners shall provide appropriate clearances and instructions and shall integrate them in the provision of control service.			
3.1. Types and Contents of ATC Clearance			
3.1.1. Define ATC clearance	1	ICAO Annex 2 Chapter 1	
3.1.2. Describe the contents of an ATC clearance	2	ICAO Doc 4444; ICAO Annex 11	
3.1.3. Issue appropriate ATC clearances	3		
3.2. ATC Instructions			
3.2.1. Define ATC instructions	1	ICAO Doc 4444 Chapter 1	
3.2.2. Describe the contents of ATC instructions	2	ICAO Doc 4444, ICAO Annex 11	
3.2.3. Issue appropriate ATC instructions	3		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
4. COORDINATION			
4.1. Principles, Types and Content			
4.1.1. Explain the principles, types and content of coordination	2	e.g. notification, negotiation, agreement, transfer of flight data and local agreements, etc. ICAO Doc 4444, ICAO Annex 11, etc.	
4.2. Necessity			
4.2.1. Appreciate the need for coordination	3	e.g. Electronic transfer of flight data; Telephone; Interphone; Intercom; Direct speech; Radiotelephone (RTF); Local agreements, ICAO Doc 4444	
4.3. Means			
4.3.1. Describe the means of coordination	2	e.g. Datalink, telephone, intercom, voice, etc.	
4.3.2. Use the available means for coordination	3		
5. ALTIMETRY AND LEVEL ALLOCATION			
5.1. Altimetry			
5.1.1. Appreciate the relationship between height, altitude and flight level	3	QFE, QNH, standard pressure	
5.2. Transition Level			
5.2.1. Appreciate the relationship between transition level, transition altitude and transition layer	3	ICAO Doc 4444 Chapter 4 ICAO Doc 8168	
5.2.2. Calculate transition levels	3		
5.3. Level Allocation			
5.3.1. Describe the cruising level allocation system	2	ICAO Annex 2, tables of cruising levels	
5.3.2. Choose appropriate levels	3	Flight levels, altitudes, heights	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
6. SEPARATION METHODS AND MINIMA			
6.1. Vertical Separation			
6.1.1. State the vertical separation standards and procedures	1	ICAO Doc 4444	
6.1.2. Apply vertical separations	3		
6.2. Horizontal Separation and Procedures			
6.2.1. State the longitudinal separation standards and procedures based on time and distance	1	ICAO Doc 4444	
6.2.2. Apply longitudinal separations	3		
6.2.3. State the lateral separation standards and procedures	1	ICAO Doc 4444	
6.2.4. Apply lateral separations	3		
6.3. Visual Separation			
6.3.1. State the occasions when visual separation can be used	1	Separation provided by pilot, VMC climb and descent	
6.4. Geographic Separation			
6.4.1. Explain the use of geographic separation	2		
6.5. Wake Turbulence Separation			
6.5.1. Explain the wake turbulence categories and separations	2	ICAO Doc 4444 National categories	
6.6. Radar Separation			
6.6.1. Explain the use of radar in ATS	2	ICAO Doc 4444	
6.6.2. Explain the radar separation standards and procedures	2	ICAO Doc 4444	
6.6.3. Apply radar separation	3		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
7. COLLISION AVOIDANCE AND SAFETY NETS			
7.1. Airborne			
7.1.1. Explain the effect of airborne collision avoidance systems on ATC operations	2	e.g. ACAS traffic alerts, ACAS ATC Procedures, ICAO Doc 4444 Chapter 15 ICAO Doc 7030, EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations	
7.2. Ground			
7.2.1. Explain the effect of conflict alert systems on ATC operations	2	e.g. MTCA, STCA, MSAW, DAIW	
8. DATA DISPLAY			
8.1. Data Extraction			
8.1.1. Extract pertinent data from a flight plan to produce a flight progress display	3	e.g. Flight progress strips, electronic data display	
8.1.2. Extract pertinent data from other sources to produce a flight progress display	3	Pilot reports, coordination, data exchange	
8.2. Data Management			
8.2.1. Update the data display to accurately reflect the traffic situation	3	e.g. Strip marking symbols, strip movement procedures, electronic data	

SUBJECT 4: METEOROLOGY

The general objective is:

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

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. INTRODUCTION			
1.1. Units of Measurement			
1.1.1. Apply the units of measurement appropriate to meteorology	3		
1.2. Aviation and Meteorology			
1.2.1. Explain the relevance of meteorology in aviation	2		
1.3. Organisation of Meteorological Service			
1.3.1. Name the basic duties, organisation and working methods of meteorological offices	1		
1.3.2. State the International and National standards for the exchange of meteorological data	1		
1.3.3. Recognise methods for the collection of meteorological data	1	e.g. Barometer, thermometer, ceilometer, anemometer, weather balloons, transmissometer, radar, satellites, etc.	
2. ATMOSPHERE			
2.1. Composition and Structure			
2.1.1. State the composition and structure of the atmosphere	1	Gases, layers	
2.2. Standard Atmosphere			
2.2.1. Describe the elements of the ISA	2	Temperature, pressure, density	
2.2.2. State the reasons why the ISA has been defined	1		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
2.3. Air Masses and General Air Circulation			
2.3.1. Describe the origin and movement of typical air masses	2	Polar, arctic, tropical, equatorial (maritime and continental)	
2.3.2. State the major wind systems on the Earth	1	Polar east winds, west wind zone, trade winds, inter-tropical convergence zone	
2.4. Frontal Systems			
2.4.1. Describe the high and low pressure systems	2		
2.4.2. Appreciate the difference between various fronts and the associated weather	3	Warm front, cold front, occluded front	
3. ATMOSPHERIC PROCESSES			
3.1. Heat and Temperature			
3.1.1. Recognise the processes by which heat is transferred and how the atmosphere is heated	1	Radiation, convection, advection, conduction, turbulence	
3.1.2. Describe how temperature varies	2	Lapse rates, land/sea variations	
3.2. Water in the Atmosphere			
3.2.1. Differentiate between the different terms related to air saturation levels	2	Saturation, condensation, evaporation, relative humidity, dew point, sublimation and latent heat	
3.3. Air Pressure			
3.3.1. Describe the relationship between pressure, temperature and height	2		
3.3.2. Explain the relationship between pressure settings	2	QFE, QNH, standard pressure	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
4. METEOROLOGICAL PHENOMENA			
4.1. Clouds			
4.1.1. Explain the different conditions for the formation of clouds	2		
4.1.2. Recognise different cloud types and state their characteristics	1		
4.1.3. State how the amount of cloud is measured	1		
4.1.4. Define cloud base and ceiling	1		
4.1.5. Differentiate between cloud base and ceiling	2		
4.2. Precipitation			
4.2.1. Explain the significance of precipitation in aviation	2		
4.2.2. Describe all types of precipitation and their corresponding cloud families	2	e.g. falling rain, snow, sleet, hail, precipitation and microphysics	
4.3. Visibility			
4.3.1. Explain the causes of atmospheric obscurity	2	e.g. advection fog, radiation fog, mixing, evaporation, mist, drizzle, snow, haze	
4.4. Wind			
4.4.1. Explain the significance of wind phenomena and types	2	e.g. veering, backing, gusting, jet streams, land/sea breezes, Föhn, surface, upper	
4.4.2. State how wind is measured	1		
4.4.3. List forces which influence wind	1	EUROCONTROL CBT	
4.5. Meteorological Hazards			
4.5.1. State the meteorological hazards to aviation	1	e.g. Turbulence, thunderstorms, icing, microbursts, squall, macroburst	
4.5.2. Describe the effect of meteorological hazards on aviation	2		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
5. APPLICATION OF METEOROLOGICAL INFORMATION			
5.1. Meteorological Messages and Reports			
5.1.1. Decode and apply the content of weather reports and forecasts	3	METAR, SPECI, TAF, SIGMET, FIS, clearances, instructions	
5.2. Meteorological Charts			
5.2.1. Decode and apply information from the most commonly used weather charts	3	e.g. low-level charts, high-level charts, significant weather charts, FIS, clearances, instructions	

SUBJECT 5: NAVIGATION

The general objective is:

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

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. INTRODUCTION			
1.1. Units of Measurement			
1.1.1. Apply the units of measurement appropriate to navigation	3		
1.2. Purpose and Use of Navigation			
1.2.1. Explain the need for navigation in aviation	2		
1.2.2. Characterise navigation methods	2	e.g. Historical overview, celestial, on-board, radio, satellites	
2. THE EARTH			
2.1. Place and Movement of the Earth			
2.1.1. Explain the Earth's properties and their effects	2	e.g. Form, size, rotation, revolution in space, seasons, day, night, twilight, units of time, time zones, UTC	
2.2. System of Coordinates, Direction and Distance			
2.2.1. Characterise the general principles of a grid system	2	e.g. Degrees, minutes, seconds, WGS-84, latitude/longitude	
2.2.2. Explain direction and distance on a globe	2	e.g. Great circle, small circle, rhumb line, cardinal points, inter-cardinal points	
2.2.3. Estimate position on the Earth's surface	3	e.g. Latitude/longitude	
2.2.4. Estimate distance and direction between two points	3		
2.3. Magnetism			
2.3.1. Explain the general principles of the Earth's magnetism	2	True north, magnetic north, variation, deviation, inclination	
2.3.2. Calculate conversions between the three north designations	3	True north, magnetic north, compass north	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
3. MAPS AND AERONAUTICAL CHARTS			
3.1. Map Making and Projections			
3.1.1. Demonstrate how the Earth is projected to create a map	2	Types of projections	
3.1.2. Describe the properties of an ideal map	2	e.g. Conformality, constant scale, true azimuth, rhumb lines and great circles	
3.1.3. Explain the properties and uses of different projections	2	e.g. Lambert, Mercator	
3.2. Maps and Charts Used in Aviation			
3.2.1. Differentiate between the various maps and charts and state their specific use	2	e.g. AIP maps and charts, National and military maps and charts	
3.3. Symbols			
3.3.1. Decode symbols and information found on maps and charts	3		
4. APPLIED NAVIGATION			
4.1. Measurement			
4.1.1. Measure the distance between two points	3		
4.2. Influence of Wind			
4.2.1. Appreciate the wind influence on the flight-path	3	Heading, track, drift, wind vector	
4.3. Speed			
4.3.1. Explain the relationship between various speeds used in aviation	2	True air speed, ground speed, indicated air speed (including Mach number)	
4.3.2. Appreciate the use of various speeds in ATC	3		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
5. RADIO NAVIGATION			
5.1. Pilot Interpreted Ground-based Systems			
5.1.1. Explain the working principles of ground-based systems	2	e.g. NDB, VOR, TACAN, DME, ILS and marker beacons, MLS, VLF	
5.1.2. Describe the use, precision and limitations of ground-based systems	2	e.g. NDB (ADF), VOR (TACAN) DME, ILS and marker beacons MLS, VLF	
5.2. On-Board Systems			
5.2.1. Explain the working principles and use of on-board systems	2	e.g. INS, FMS and navigational computers (area navigation)	
5.3. Satellite-based Systems			
5.3.1. Explain the working principles and use of satellite-based navigational systems	2	GPS, GLONASS, GNSS	

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SUBJECT 6: AIRCRAFT

The general objective is:

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

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. INTRODUCTION			
1.1. Units of Measurement			
1.1.1. Apply the units of measurement appropriate to aircraft and principles of flight	3		
1.2. Aviation and Aircraft			
1.2.1. Explain the relevance of theory of flight and aircraft characteristics on ATS operations	2		
2. PRINCIPLES OF FLIGHT			
2.1. Forces Acting on Aircraft			
2.1.1. Explain the forces acting on an aircraft in flight	2	Lift, thrust, drag, weight	
2.2. Structural Components and Control of an Aircraft			
2.2.1. List the main structural components of an aircraft	1	Wing (anhedral, dihedral, delta), tail plane, fuselage, flap, aileron, elevator, rudder, airfoil shape, landing gear	
2.2.2. Explain how the pilot controls the movements of an aircraft	2	e.g. rudder, aileron, elevator, throttle, rotary wing controls	
2.3. Flight Envelope			
2.3.1. Characterise the critical factors which affect aircraft performance	2	Maximum speeds, stall speeds, ceiling, streamline flow, turbulent flow, angle of attack	
3. AIRCRAFT ENGINES			
3.1. Piston Engines			
3.1.1. Explain the operating principles, advantages and disadvantages of the piston engine and propeller	2	Piston engines, fixed pitch, variable pitch, number of blades	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
3.2. Jet Engines			
3.2.1. Explain the operating principles, advantages and disadvantages of the jet engine	2		
3.2.2. List the different types of jet engines	1		
3.3. Turboprop Engines			
3.3.1. Explain the operating principles, advantages and disadvantages of the turboprop engine and propeller	2		
4. AIRCRAFT INSTRUMENTS			
4.1. Flight Instruments			
4.1.1. Explain the basic operating principles and interpretation of cockpit instruments	2	Altimeter, air speed indicator, vertical speed indicator, turn and bank indicator, artificial horizon, gyrosyn compass	
4.2. Navigational Instruments			
4.2.1. Explain the basic on-board operating principles and interpretation of radio aids to navigation	2	e.g. Displays for NDB (ADF), VOR (TACAN), DME, ILS, MLS, VLF based systems, satellite-based systems	
4.3. Engine Instruments			
4.3.1. List the vital engine monitoring parameters and their associated instruments	1	e.g. Oil pressure and temperature, engine temperature, rpm, fuel state and flow	
4.4. Additional Instruments			
4.4.1. Explain the use of other cockpit instruments	2	e.g. SSR transponder, head up display, GPWS, wind shear indicator, weather radar, autopilot, FMS, EFIS, TCAS indication	
4.5. Abnormal Indications			
4.5.1. Explain the impact of abnormal indications of instruments on the operation of aircraft	2		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
5. AIRCRAFT CATEGORIES			
5.1. Aircraft Categories			
5.1.1. List the different categories of aircraft	1	e.g. Fixed wing, rotary wing, balloon, glider	
5.2. Wake Turbulence Categories			
5.2.1. List the wake turbulence categories	1	ICAO wake turbulence categories, National categories	
5.3. ICAO Approach Categories			
5.3.1. List the ICAO approach categories	1	ICAO Doc 8168	
6. FACTORS AFFECTING AIRCRAFT PERFORMANCE			
6.1. Takeoff			
6.1.1. Explain the factors affecting aircraft during takeoff	2	Runway conditions, wind, temperature, air density, aircraft weight	
6.2. Climb			
6.2.1. Explain the factors affecting aircraft during climb	2	Speed, weight, altitude, wind and temperature, cabin pressurisation, air density	
6.3. Cruise			
6.3.1. Explain the factors affecting an aircraft during cruise	2	Level, cruising speed, wind, weight, air density, cabin pressurisation	
6.4. Descent and Initial Approach			
6.4.1. Explain the factors affecting an aircraft during descent	2	Wind, speed, rate of descent, aircraft configuration, cabin pressurisation, air density	
6.5. Final Approach and Landing			
6.5.1. Explain the factors affecting an aircraft during final approach and landing	2	Aircraft configuration, weight, wind, wind shear, air density, runway conditions	
6.6. Economic Factors			
6.6.1. Explain the economic consequences of ATC changes on the flight profile of an aircraft	2	Routing, flight level, speed, rates of climb or descent	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
6.7. Ecological Factors			
6.7.1. Explain performance restrictions due to ecological constraints	2	e.g. Fuel dumping, noise abatement procedures, minimum flight levels	
6.8. Miscellaneous Factors			
6.8.1. Explain special operational requirements which affect aircraft performance	2	e.g. Military flying, calibration flights, aerial photography	
7. AIRCRAFT DATA			
7.1. Recognition			
7.1.1. Recognise the 50 most commonly used aircraft	1	e.g. Fixed wing, rotary wing, balloon, glider	
7.2. Performance Data			
7.2.1. State the ICAO aircraft type designators and categories for the 50 most commonly used aircraft	1	Type designators, approach and wake turbulence categories	
7.2.2. State the standard average performance data of the most commonly used aircraft	1	Rate of climb/descent, cruising speed, ceiling	

SUBJECT 7: HUMAN FACTORS

The general objective is:

Students shall characterise factors which affect personal and team performance.

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. INTRODUCTION TO HUMAN FACTORS			
1.1. Introduction			
1.1.1. List the topics that will be covered in the course	1	Why human factors, human performance, safety and error, communication, work environment	
1.1.2. List the reference documents used	1	e.g. ICAO Human Factors Training Manual, EATCHIP/EATMP publications, Air Traffic Control - Human Performance Factors (Isaac, 1999), Human Factors in Air Traffic Control (Hopkin, 1995)	
1.2. Why Human Factors			
1.2.1. Explain why human factors is a subject in this course	2	Historical background, developments in ATC, ICAO regulations, licensing requirements	
1.2.2. Define human factors	1	ICAO Human Factors Training Manual	
1.2.3. Explain the concept of systems	2	Systems definition	
1.2.4. Define ATM in systems terms	1	ATS, ASM, ATFM	
1.2.5. Recognise the consequences of a systems failure in the ATS	1		
1.2.6. Explain the need for matching human and machine	2	e.g. ICAO Human Factors Training Manual	
1.2.7. Explain the use and benefits of the SHEL model	2	ICAO Human Factors Training Manual	
1.2.8. Explain the information requirement of ATC	2	Relevant, timely, accurate	
1.2.9. Describe the evolution of ATC	2	e.g. History of ATC, airspace, communications, radar, the future of ATC, role of the human	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
2. HUMAN PERFORMANCE The student shall appreciate the need to take account of human performance in the performance of work and learning.			
2.1. Individual Behaviour			
2.1.1. Explain the differences and commonalities that exist between people	2	e.g. Attitudes, cultural, language	
2.1.2. Explain the dangers of boredom	2		
2.1.3. Explain the dangers of over-confidence and complacency	2		
2.1.4. Explain the dangers of fatigue	2	Sleep disturbance, heavy workload	
2.1.5. Describe the positive effect of working and learning together with fellow course participants	2	How the influence of interactive studies can lead to success	
2.1.6. Appreciate appropriate learning techniques	3		
2.2. Professional Conduct			
2.2.1. Describe the need for professional standards in ATC	2	e.g. adherence to rules and regulations, etc.	
2.3. Health and Wellbeing			
2.3.1. Consider the effect of health on performance	2	e.g. Fitness, diet, drugs, alcohol	
2.4. Teamwork			
2.4.1. Characterise the factors involved in human relations	2		
2.4.2. Characterise the factors of work satisfaction	2		
2.4.3. Describe the principles of teamwork	2	e.g. team membership, group dynamics, advantages/disadvantages of teamwork, conflicts and their solutions	
2.4.4. Describe leader style and group interaction	2		
2.5. Basic Needs of People at Work			
2.5.1. List the basic needs of people at work	1	ICAO Human Factors Training Manual	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
2.6. Stress			
2.6.1. Define stress	1	Stress definition, main causes of stress, EATCHIP Human Factors Module - Stress	
2.6.2. Recognise stress symptoms and sources	1	Behavioural changes, lifestyle changes, physical symptoms, crisis events, EATCHIP Human Factors Module - Stress	
2.6.3. Describe the stages of stress	2	Stress performance curve, EATCHIP Human Factors Module - Stress	
2.6.4. Describe techniques for stress management	2	Relaxation techniques, diet and lifestyle, exercise, EATCHIP Human Factors Module - Stress	
3. HUMAN ERROR			
3.1. Introduction			
3.1.1. Recognise the dangers of error in ATC	1	e.g. Air Traffic Control - Human Performance Factors (Isaac, 1999), Human Factors in Air Traffic Control (Hopkin, 1995)	
3.1.2. Take account of the factors of work satisfaction	2		
3.2. Definition of Human Error			
3.2.1. Define human error	1		
3.2.2. Describe the factors which help to cause error	2	e.g. fatigue, lack of skill, misunderstanding, lack of information, distraction	
3.3. Classification of Human Error			
3.3.1. State the types of errors	1	e.g. slips, lapses, mistakes, violations	
3.3.2. Explain the dangers of violations becoming accepted as a practice	2		
3.3.3. Describe the three levels of performance according to the Rasmussen Model	2	Skill based, knowledge based, rule based	
3.4. The Reason Model			
3.4.1. Describe the Reason Model	2	Active and latent failures	
3.4.2. Apply the reason principles on error during a case study	3	e.g. Herald of Free Enterprise accident	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
4. COMMUNICATION			
4.1. Introduction			
4.1.1. Demonstrate the importance of good communications in ATC	2		
4.2. The Communication Process			
4.2.1. Define communication	1		
4.2.2. Define the communication process	1	Sender, encoder, transmitter, signal, interference, reception, decoder, receiver	
4.3. A Communications Model			
4.3.1. Demonstrate a communications model	2		
4.4. Communication Modes			
4.4.1. Describe the factors which affect verbal communication	2	e.g. word choice, intonation, speed, tone, distortion, load, expectation, noise, interruption	
4.4.2. Describe the factors which affect non-verbal communication	2	e.g. touch, choice, intonation, speed, tone, distortion, load, expectation, noise, interruption	
4.4.3. Characterise good communication practices	2	Speaking and listening	
5. THE WORK ENVIRONMENT			
5.1. Introduction			
5.1.1. Define ergonomics	1		
5.1.2. Explain the need for good building design	2	e.g. light, insulation, decor, space, facilities	
5.1.3. Explain the need for good work position design	2	e.g. anthropometry	
5.2. Equipment and Tools			
5.2.1. Characterise the equipment and tools that will be used in simulation	2	The physical environment, visual displays, suites, input devices, communication equipment, console profile and layout	
5.2.2. Apply the SHEL Model principles during a visit to the simulator	3		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
5.3. Automation			
5.3.1. Explain the reasons for automation	2		
5.3.2. Describe the constraints of automation	2		
5.3.3. Take account of the implications of team functions and automation	2		

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SUBJECT 8: EQUIPMENT AND SYSTEMS

The general objective is:

Students shall:

i. explain the basic working principles of equipment that is in general use in ATC;

ii. appreciate how this equipment aids the controller in providing a safe and efficient ATS;

iii. use computer equipment in order to successfully complete CBT and to handle electronic data displays.

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. GENERAL			
1.1. ATC Equipment			
1.1.1. Characterise the main items of ATC equipment	2	e.g. Communication equipment, VDF/UDF, radars	
2. RADIO			
2.1. Radio Theory			
2.1.1. State principles of radio	1		
2.1.2. Recognise the characteristics of radio waves	1	Propagation, limitations	
2.1.3. State the use, characteristics and limitations of frequency bands	1	Use in ATC, navigation and communications, use and application in the Aeronautical Mobile Service, HF, VHF, UHF	
2.2. Radio Communications			
2.2.1. State the use of the radio in ATC	1		
2.2.2. Describe the working principles of a transmitting and receiving system	2		
2.2.3. Recognise, on a basic block diagram, the components of a transmitter/receiver system	1		
2.3. Direction Finding			
2.3.1. State the principles and use of VDF/UDF	1	VDF/UDF, QDM, QDR, QTF	
2.3.2. State the precision of VDF/UDF used in the State system	1		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
3. OTHER SYSTEMS AND COMMUNICATIONS			
3.1. ATC Communications			
3.1.1. Describe the use of other voice communications in ATC	2	e.g. telephone, interphone, intercom	
3.2. Airline Communications			
3.2.1. State the use of SELCAL	1		
3.3. Air Ground Communications			
3.3.1. State the use of controller pilot datalink communications (CPDLC)	1		
4. RADAR			
4.1. General			
4.1.1. State the principles of radar	1		
4.1.2. Recognise the characteristics of radar wavelengths	1		
4.1.3. Recognise the use, characteristics and limitations of different radar types	1	e.g. frequency bands, long- and short-range radar, weather radar, high-resolution radar	
4.2. Primary Radar			
4.2.1. Explain the working principles of PSR	2		
4.3. Secondary Radar			
4.3.1. Explain the working principles of SSR	2	Mode A, Mode C	
4.4. Use of Radars			
4.4.1. Explain the use of PSR/SSR in ATC	2	Area, approach, aerodrome, surface movement radar, DFTI	
4.4.2. Explain the link between PSR/SSR with automated systems	2		
4.4.3. Explain the advantages and disadvantages of PSR/SSR	2		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
4.5. Mode S			
4.5.1. State the principles of Mode S	1		
4.5.2. Explain the use of Mode S in ATC systems	2		
4.6. Precision Approach Radar			
4.6.1. State the principles of PAR	1		
5. AUTOMATIC DEPENDENT SURVEILLANCE			
5.1. Automatic Dependent Surveillance			
5.1.1. State the working principles of ADS	1	Satellites, datalinks, GPS	
5.1.2. Explain the use and limitations of ADS	2		
6. FUTURE EQUIPMENT			
6.1. Future Equipment			
6.1.1. Be aware of developments in the equipment field	0	Equipment to be introduced beyond training period	
7. COMPUTERISATION			
7.1. Computer			
7.1.1. Explain the working principles of a computer	2		
7.1.2. Describe the way information is compiled, processed and distributed	2		
7.2. Computer Systems			
7.2.1. State the difference between hardware and software	1		
7.2.2. Recognise the hardware components	1	e.g. terminal, printer, keyboard, monitor, modem, network	
7.2.3. Recognise the software components	1	e.g. programmes and applications, operating systems, files	

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
7.3. Utilisation			
7.3.1. Describe operating systems in general use	2		
7.3.2. Use input devices	3	Mouse, keyboard, voice, TID	
7.3.3. Use text processing application	3	Text processors	
7.3.4. Use storage devices	3	File system, hard and floppy disks	
8. AUTOMATION IN ATS			
8.1. General			
8.1.1. Describe the principles of automation in communication and datalinks in ATS	2		
8.2. Aeronautical Fixed Telecommunication Network (AFTN)			
8.2.1. Describe the principles of AFTN	2		
8.3. On-line Data Interchange			
8.3.1. Recognise the benefits of automatic exchange of ATS data in coordination and transfer processes	1	Accuracy, speed and safety, non-verbal communications	
8.3.2. Recognise the limitations of automatic exchange of ATS data in coordination	1	Non-recognition of a systems failure	
8.4. Closed Circuit Information System			
8.4.1. State the principles of CCIS	1		
8.4.2. Explain the use of CCIS in ATS	2	Data carried on CCIS	
8.5. Systems Used for the Automatic Dissemination of Information			
8.5.1. State the working principles of broadcasting systems	1	e.g. ATIS, VOLMET	
8.5.2. Explain the use of ATIS and VOLMET in the ATS	2		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
9. WORKING POSITIONS			
9.1. General			
9.1.1. Recognise equipment in a working position	1	e.g. FPB, radio, telephone and other communication equipment, relevant maps and charts, strip printer, teleprinter, clock, information monitors, radars/displays	
9.2. Aerodrome Control			
9.2.1. Recognise equipment to be found specifically in a TWR	1	e.g. Wind indicator, DFTI, SMR, crash alarm, signalling lamp, lighting control panel, runway-in-use indicator, binoculars, signalling/flare gun, IRVR and altimeter setting indicators, CCIS	
9.3. Approach Control			
9.3.1. Recognise equipment to be found specifically in an APP	1	e.g. Sequencing system, PAR, RVR indicators	
9.4. Area Control			
9.4.1. Recognise equipment to be found specifically in an ACC	1		

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SUBJECT 9: PROFESSIONAL ENVIRONMENT

The general objective is:

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

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
1. FAMILIARISATION			
1.1. Familiarisation			
1.1.1. Familiarise with civil and military ATS facilities	0	e.g. TWR, APP, ACC, AIS, RCC, Radar, Air Defence Unit	
1.1.2. Familiarise with airport facilities and local operators	0	e.g. fire and emergency services, airline operations office	
2. AIRSPACE USERS			
2.1. Civil Aviation			
2.1.1. Be aware of the different airspace requirements for civil aircraft	0	e.g. Commercial flying, recreational flying, gliders, balloons	
2.2. Military Aviation			
2.2.1. Be aware of the different airspace requirements for military aircraft	0	e.g. Low-level flying, in-flight refuelling, test flights, special military operations	
2.3. Expectations and Requirements of Pilots			
2.3.1. Be aware of the expectations and requirements of pilots	0		
3. CUSTOMER RELATIONS			
3.1. Customer Relations			
3.1.1. State the role of ATC as a service provider	1		
3.1.2. Recognise the means by which ATC is funded	1		

TOPIC / Sub-topic			
OBJECTIVES	**L**	**CONTENT**	**Task**
4. ENVIRONMENTAL PROTECTION			
4.1. Environmental Protection			
4.1.1. Recognise the importance of environmental protection	1	Air, water, noise	

PART 3: RATING TRAINING

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1. THE RATING COURSE

1.1 Rating Training Definition

Specialised ATC training to provide knowledge and skills related to a job category and appropriate to the discipline to be pursued in the ATS environment.

1.2 General Aim of a Rating Training

Following successful completion of the basic course, the rating training, which is normally conducted in a training institute, is designed to impart to the learners the required knowledge, understanding and skills which will enable them to progress to pre-OJT.

A rating course is a course designed to implement the rating training.

A rating course includes one or several of the eight defined rating training modules.

The composition of the rating course is decided at the level of the local implementation of the CCC.

Note: Nothing prevents a State from amalgamating the Basic and Rating training courses to provide a single course. On the other hand, if there is a gap between Basic and Rating training, it is to be remembered that no objective of the Basic training is repeated as 'a refresher' in the Rating training and that the learner needs to be able to perform correctly all the Basic training objectives when starting any Rating training.

1.3 Limitations

1.3.1 Simulation

In many cases the objective is clearly of a practical training nature and therefore likely to be reached in a simulated environment.

No attempt has been made to provide for tools and methodology in this document, and objectives do not indicate 'in simulation ...', unless this was specifically required. However, where simulation is an obvious method it should be considered that the simulated environment should be related to the specific rating.

1.3.2 Complementary training in aviation

Familiarisation visits, flight simulator training and familiarisation flights are beneficial. It is recognised that these facilities may not always be available to trainers. This document encourages training institutes to make use of these facilities when they are available.

1.3.3 Specification of surveillance

The European Manual of Personnel Licensing – Air Traffic Controllers (see EATM, 2004a – L1) defines surveillance as the use of either Automatic Dependent Surveillance (ADS) or radar.

The TF-CCC thought that use of ADS and any future data-based systems should be considered separately from that of radar. At present ADS has a limited functionality within the ECAC area. The surveillance ratings are therefore, at least for the time being, combined with a radar endorsement.

Accordingly, throughout the work and documentation of this group, 'surveillance equipment' means radar primary surveillance or radar secondary surveillance.

2. ORGANISATION OF THE OBJECTIVES PER SUBJECT

In addition to the subjects of Basic training, three new subjects are introduced: 'Unusual/emergency situations', 'Degraded systems capability' and 'Aerodromes'.

3. SURVEILLANCE CONTROL

3.1 Definitions

In order to make clear what the requirements of a future-oriented training concept are, it was first necessary to define **Area Control** and **Approach Control** accurately. It was not easy to integrate the different aspects of area control into one definition which took account of all the above mentioned. There was a mixed tasking to be considered, particularly in the lower airspace, where en-route, TMA and approach elements may be closely aligned. In some States joint centre units combining two or more of these functions are already being developed and this should form part of the considerations.

Furthermore, it was becoming clear that aerodrome controllers were likely to increasingly be involved in what had previously been seen as approach functions, including the use of radar equipment.

It soon became obvious that a new definition of area control could no longer be based on the traditional dimensional airspace, but rather on the function and/or service provided. Whilst the 'gate-to-gate' concept is not yet finalised, the drafting group was cognisant of the development. For example, an area function could be said to begin at the pre-start-up phase of a flight when slots and route planning are considered.

Also the matter of procedural control was considered and it was agreed that, whilst it was becoming less important in the ECAC area as surveillance systems were developed and installed, it nevertheless needed to be included in the deliberations.

In a radar environment, expertise in traditional procedural control was used as a systems failure contingency. It is now recognised that this is no longer a practical scenario and that controllers are unlikely to be in a position to maintain a full procedural competency. The group found that there was not a common set of non-radar procedures for use in the event of radar failure. A separate radar failure contingency subject has therefore been provided. The group strongly recommends that each radar unit should define a contingency plan in the case of radar failure in their own radar environment and customise this training subject accordingly.

3.2 Area Control Service

ICAO defines **Area Control Service** as an ATC service for controlled flights in control areas.

In order to achieve a high degree of modularity in the training, this definition has been adapted to match both the current operational work organisation and the licensing manual structure.

The adaptation produced two definitions:

- **En-route Area Control Service** is an ATC service, with or without the use of surveillance facilities, to aircraft within an en-route sector of airspace under the jurisdiction of an ATS unit;
- **Terminal Area Control Service** is an ATC service provided within a designated airspace to facilitate the arrival and departure of aircraft to or from one or more aerodromes.

3.3 Approach Control Service

Approach Control Service is an ATC service provided within a designated airspace to facilitate the arrival and departure of aircraft to or from one or more aerodromes.

The definition is equal to Terminal Area Control Service. In fact, the functions and services provided by TMA and APP are being increasingly merged.

In defining the training needs, it was established that a very significant percentage of the content was identical for both disciplines. The difference lies in the context rather than in the corpus or the content of the objective. Therefore, it became necessary for the Task Force to define the area of responsibility for each of these services in generic terms.

- An **Approach Control Service** starts at a point, agreed by individual States, where the en-route controller or the terminal area controller or the aerodrome controller hands over responsibility to the approach controller. It terminates at a point, agreed by individual States, where the approach controller hands over responsibility to the en-route controller or the terminal area controller or the aerodrome controller.

- A **Terminal Area Control Service** starts at a point, agreed by individual States, where the en-route controller or the aerodrome/approach controller hands over responsibility to the terminal area controller. It terminates at a point, agreed by individual States, where the terminal area controller hands over responsibility to the en-route controller or the aerodrome/approach controller.

3.4 Training Modules for Surveillance

The practical outcome of this analysis is the creation of three modules consistent with the European Manual of Personnel Licensing – Air Traffic Controllers (see EATM, 2004a – L1) in order to specify the surveillance ratings training:

- **APS/RAD**: Approach Control Surveillance Rating with Radar Endorsement,
- **ACS/RAD**: Area Control Surveillance Rating with Radar Endorsement,
- **TCL**: Terminal Control Endorsement.

The Training Modules specify the common 'core' training objectives. When the CCC modularity does not fit the operational organisation so that a single module is not appropriate, the relevant objectives have to be added.

For example, as the current operational organisation of airspace varies greatly and in order to highlight the fact that ACS concentrates mainly on the en-route phase of flights at higher flight levels, objectives that deal with the knowledge of aerodrome or with the arrival or departure phases of flight were included in APS and TCL but not in ACS.

To prepare for operation in lower airspace, it is possible to add relevant objectives that deal with arrival or departure to ACS or to complete it with the full TCL.

It is also possible to add the TCL or parts of it to APS in order to prepare for operation in lower airspace outside Approach Control Areas, if this is decided to be more adequate.

4. AERODROME CONTROL

4.1 Aerodrome Control Service

ICAO defines Aerodrome Control Service as an ATC service provided to aerodrome traffic.

To maintain an alignment with the guidance given in the European Manual of Personnel Licensing – Air Traffic Controllers (see EATM, 2004a – L1), the delivery of the aerodrome control rating was split as follows: Visual Flight Rules (VFR) and Instrument Flight Rules (IFR).

Aerodrome Control Service (VFR) is an ATC service provided to aerodrome traffic whose flight is conducted in accordance with the visual flight rules.

The Aerodrome Control Visual rating (ADV) may be granted to controllers who are competent to provide an ATC service at an aerodrome where:

- there are no published instrument approach or departure procedures,
- there is no established approach control unit,
- an approach service is not provided remotely.

The ADV has no associated rating endorsements. States may wish to develop their own endorsements to be associated with this rating.

Aerodrome Control Service (IFR) is an ATC service provided to aerodrome traffic whose flight is conducted in accordance with IFR.

The Aerodrome Control Instrument rating (ADI) may be granted to controllers who are competent to provide an ATC service at aerodromes where:

- there are published approach and/or departure procedures;
- there is an associated approach control unit;
- an approach control service is provided from a remote unit, e.g. an area control centre.

The ADI shall be associated with one or more endorsements:

- air control,
- Ground Movement Control (GMC),
- tower control – incorporating air control **and** GMC,
- Ground Movement Surveillance (GMS),
- Aerodrome Radar Control.

Aerodrome RADAR Control is defined by the use of surveillance radar for the provision of an aerodrome control service as described in ICAO Document 4444 Chapter 8.10.

The practical outcome of this analysis is the creation of three modules consistent with the European Manual of Personnel Licensing in order to specify the aerodrome rating training:

- **ADV**: Aerodrome Control Visual Rating,
- **ADI**: Aerodrome Control Instrument Rating,
- **ADI/RAD**: Aerodrome Radar Control Endorsement.

5. PROCEDURAL CONTROL

According to the European Manual of Personnel Licensing, an Approach Control Procedural (APP) rating entitles the holder to provide an air traffic control service to arriving, departing or transiting aircraft in a control area and/or control zone without the use of surveillance equipment. An Area Control Procedural (ACP) rating entitles the holder to provide an air traffic control service in control areas without the use of surveillance equipment.

Two Initial rating training modules have been created to prepare the learner for these two ratings:

- APP Approach Control Procedural prepares APP,
- ACP Area Control Procedural prepares ACP,

6. FLEXIBLE USE OF CCC TRAINING MODULES

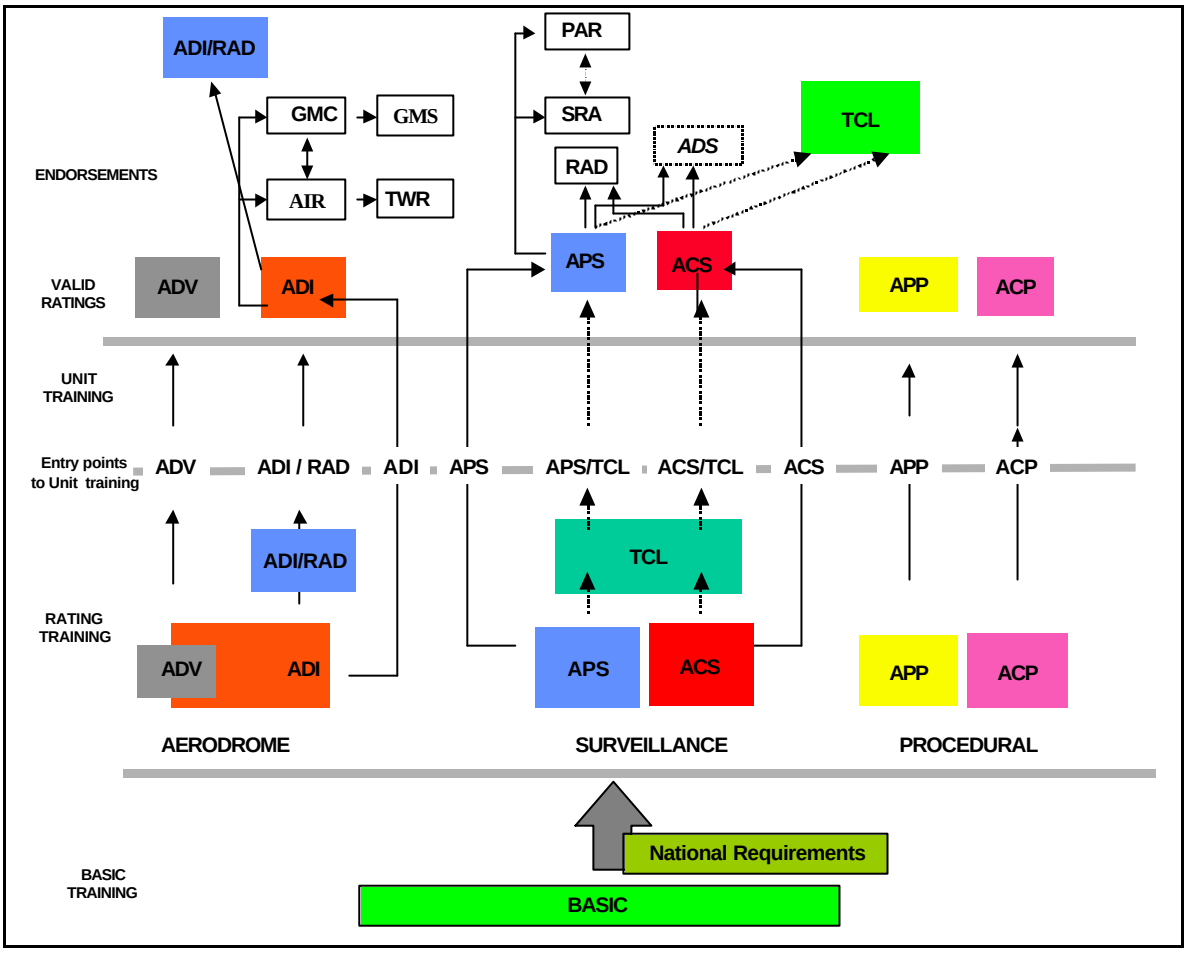

Figure 4: Relationship between training phases: from Basic training through Rating training to OJT.

Glossary of abbreviations and acronyms used in the figure

ACP	Area Control Procedural
ACS	Area Control Surveillance
ADI	Aerodrome Control Instrument
ADS	Automatic Dependent Surveillance
ADV	Aerodrome Control Visual
AIR	Air Control
APP	Approach Control Procedural
APS	Approach Control Surveillance
ADI/RAD	Aerodrome Radar Control
GMC	Ground Movement Control
GMS	Ground Movement Surveillance

PAR	Precision Approach Radar
RAD	Radar
SRA	Surveillance Radar Approach
TCL	Terminal Control
TWR	Tower Control

The diagram indicates which modules are adequate to prepare the future ATC learner for a given ATC licence rating or endorsement.

For example:

A course designed to provide training for an aerodrome radar controller requires the trainer to use:

Basic + RATING ADI and ADI/RAD.

A course designed to provide training for a TCL controller requires the trainer to use:

Basic + Rating APS or ACS and TCL.

The diagram also indicates the prerequisite links between initial training modules:

Basic is a prerequisite to any Rating training module.

Note: Nothing prevents a training provider from amalgamating the Basic and Rating training courses to provide a single course. On the other hand, if there is a gap between Basic and Rating training, it is to be remembered that no objective of the Basic training is repeated as 'a refresher' in the Rating training and that the learner needs to be able to perform correctly all the Basic training objectives when starting any Rating training.

ADI module is a prerequisite to ADI/RAD.

Either area surveillance including radar endorsement (ACS) or approach surveillance including radar endorsement (APS), is a prerequisite for a TCL endorsement.

Finally, the diagram may be used to indicate how the reader may use the documents to create courses.

Note: CCC flexibility allows any combination or merging of the initial modules compliant with the prerequisite links. There are prerequisite links :

- between Basic and Rating training,
- between ADI and ADI/RAD,
- between ACS and TCL, or between APS and TCL.

At the time of entering the next phase of training, the learner is supposed to fulfil all the prerequisite objectives.

7. AREA CONTROL TASK ANALYSIS

7.1 Introduction

The following list of task clusters and associated subtasks have been developed on the basis of the proposal published in the 'Model for Task and Job Descriptions of Air Traffic Controllers' (EATCHIP, 1996a – HF1). The definitions, as published in that issue, apply. Some changes and adaptations seemed to be feasible.

- Some coordination tasks appear now as Core Task 4 (CT4), because they are directly related to the provision of separation and can therefore not be seen as a 'Direct Support Task (DST)' only.

- Only the 'Indirect Support Tasks' IST4 and IST7 appear in the following list, because the other ISTs, listed in the above-mentioned issue, are not necessarily tasks of each controller. They constitute tasks, which may be delegated to some controllers, depending on their experience and the additional centre functions they may have.

The following task list forms the basis for the development of a training guideline for a 'Centre Rating Course' and, therefore, is applicable for all control functions except aerodrome control.

7.2 Task Cluster and Associated Subtasks of a Centre Controller

A CONTROLLER SHALL ALWAYS ACT IN ACCORDANCE WITH EXISTING RULES, REGULATIONS AND PRESCRIBED PROCEDURES.

7.2.1 Core tasks

CT1 Maintain Situational Awareness

TASK		REMARKS
1.1	**Keep scanning traffic displays.**	
1.1.1	Scan flight data displays.	
1.1.2	Scan other electronic displays.	Automatic coordination displays, vertical view, metering and sequencing displays, etc.
1.2	**Consider current weather situation.**	Obtain appropriate weather information RVR, TAF, SIGMET, UWF, AIREP, etc.
1.3	**Continuously analyse traffic situation.**	Consider future, present and past traffic.
1.4	**Evaluate traffic for control action.**	
1.5	**Monitor and check the compliance with ATC clearances and instructions.**	
1.5.1	Obtain relevant information and position reports from pilots.	
1.5.1.1	Update flight data display.	
1.6	**Be aware of possible abnormal situations.**	
1.7	**Be aware of possible equipment limitations.**	Consider complete failures and degraded functioning of: traffic displays, flight data displays, RTF and other communication equipment, etc.
1.8	**Be aware of possible influences of ATM regulations and procedures.**	ATFM, FUA, RVSM, etc.
1.9	**Consider aircraft performance capabilities.**	
1.10	**Be aware of internal and external workload and requirements.**	

CT2 Make Decisions for Control Actions

TASK		REMARKS
2.1	**Identify potential conflict.**	
2.1.1	Scan available radar displays.	
2.1.2	Scan available flight data displays.	
2.1.3	Scan other electronic traffic displays.	
2.2	**Select appropriate action.**	
2.2.1	Select appropriate separation.	ACFT to ACFT and/or ACFT to airspace boundaries, etc.
2.2.2	Select appropriate coordination.	
2.2.3	Select appropriate spacing.	
2.3	**Allocate priority to flights.**	
2.3.1	Allocate priority to emergencies.	Radio failure, hijack, etc.
2.3.2	Allocate priority to special flights.	ICAO list of priorities.
2.3.3	Allocate priority to non-standard flights.	VIP, Military operational missions (air to air refuelling, air defence), calibration, etc.
2.3.4	Allocate priority to other flights, when necessary.	Consider: flight level allocation, order of traffic requests, time elements, shortage of fuel, etc.
2.4	Consider expedition of air traffic in the most competent manner.	
2.4.1	Consider flight priority.	
2.4.2	Consider ATFM requirements.	
2.4.3	Consider aircraft type and performance.	
2.4.4	Consider flight plan.	Routing, level, destination, etc.
2.4.5	Consider internal and external workload.	
2.5	**Consider pilots' requests for changes in flight profile.**	Route, level, speed.
2.6	**Consider the possibility of alternative clearances and instructions in consultation with the pilot when appropriate.**	Route, level, speed.
2.6.1	Consider flight plan.	

TASK		REMARKS
2.6.2	Consider airspace users benefit of action.	Fuel saving, time saving, comfort of passengers.
2.7	**Consider workload and other requirements of own and adjacent sectors/units.**	
2.8	**Consider environmental requirements.**	
2.8.1	Consider noise abatement.	
2.8.2	Consider other ecological factors.	
2.9	**Recognise abnormal situations.**	
2.10	**Allocate priority to actions.**	

CT3 Conduct Communication

TASK		REMARKS
3.1	**Conduct communication by RTF.**	Standard procedures, radio failure, degraded system.
3.2	**Conduct communication by telephone / intercom.**	
3.3	**Conduct communication by means of electronic data transfer systems.**	e. g. Mode S.

CT4 Provide Planning and Coordination Actions

TASK		REMARKS
4.1	**Ensure a safe entry and exit of aircraft into or leaving the area of responsibility.**	
4.1.1	Scan and analyse available traffic displays.	
4.1.2	Perform appropriate coordination.	

TASK		REMARKS
4.1.2.1	Coordinate within own area of responsibility.	
4.1.2.2	Coordinate with other areas of responsibility.	Other ATS agencies.
4.1.2.3	Coordinate with users of shared airspace.	FUA, military use.
4.1.2.4	Coordinate with other agencies.	Other non-ATS agencies.
4.1.3	Maintain an updated flight data and traffic display.	

CT5 Provide Control Actions

TASK		REMARKS
5.1	**Provide separation between aircraft.**	
5.1.1	Provide non-radar separation.	Provide vertical, RNAV, longitudinal, lateral or geographical separation.
5.1.1.1	Provide non-radar separation for aircraft not yet within, or about to leave, radar coverage.	
5.1.1.2	Provide non-radar separation in case of degraded radar information.	
5.1.1.3	Provide non-radar separation in non-radar control environment.	
5.1.2	Provide radar separation.	
5.1.3	Provide particular separation in specific cases.	Provide emergency separation; wake turbulence separation; separation in case of severe turbulence; separation for especially endangered flights; increased separation standards, etc.
5.2	**Delegate the responsibility for separation to pilots.**	VMC climb and descent.
5.3	**Provide essential traffic information.**	

TASK		REMARKS
5.3.1	Initiate avoiding action.	
5.4	**Expedite traffic in the most competent manner.**	Continuous climb and descent, etc.
5.5	**Comply with environmental and economic requirements.**	Noise abatement, fuel consumption, fuel dumping, etc.

CT6 Provide Pilots with Relevant Information

TASK		REMARKS
6.1	**Respond to pilot's request for information.**	
6.2	**Provide aerodrome information.**	Availability, surface conditions, etc.
6.3	**Provide weather information.**	ATIS, METAR, SIGMET, UWF, en-route weather information, radar observed weather, etc.
6.4	**Provide navigational information.**	
6.4.1	Provide navigational assistance to pilots.	
6.4.2	Provide information on the status of navigational equipment.	
6.5	**Provide traffic information.**	
6.5.1	Provide traffic information based on radar.	
6.5.2	Provide traffic information based on other sources.	Pilots' position reports.
6.5.3	Provide TCAS event information.	
6.6	**Provide air traffic flow information.**	Provide information about delay, EAT, sequence, weather, separation, spacing, etc.
6.7	**Provide information on abnormal situations.**	Weather, Mode C degradation, etc.
6.8	**Relay messages.**	

CT7 Provide Assistance to Aircraft in Abnormal Situations

TASK		REMARKS
7.1	**Allocate priorities.**	
7.2	**Notify pilots of abnormal situations.**	
7.3	**Notify other units of abnormal situations.**	
7.4	**Apply appropriate action if required.**	
7.4.1	Use checklist, when appropriate.	
7.4.2	Seek assistance.	
7.5	**Assist aircraft.**	
7.5.1	Provide navigational assistance.	
7.5.2	Provide helpful information.	
7.5.3	Provide alerting service.	Apply notification procedures.
7.5.3.1	Assist SAR activities.	
7.5.4	Provide any other required assistance.	

CT8 Provide Tactical Air Traffic Management (ATM)

TASK		REMARKS
8.1	**Make most efficient use of airspace.**	
8.1.1	Take account of flexible airspace procedures.	
8.1.2	Take account of flight plan.	
8.2	**Ensure proper sequencing of aircraft.**	

7.2.2 Direct support tasks

DST1 Check and Maintain the Integrity of the Working Position

TASK		REMARKS
1.1	**Check and monitor technical equipment.**	
1.2	**Select and adjust technical equipment.**	
1.3	**Notify any technical failure.**	
1.4	**Select and verify necessary information.**	
1.5	**Monitor human performance.**	Own and others performance.

DST2 Build up Mental Picture of Air Traffic Situation

TASK		REMARKS
2.1	**Ensure that comprehensive handover is obtained.**	Apply handover checklist, when available.
2.1.1	Confirm traffic situation.	
2.1.2	Confirm airspace situation.	
2.1.3	Confirm restrictions.	
2.2	**Check and analyse traffic situation prior to taking over control.**	
2.2.1	Analyse actual traffic situation.	
2.2.2	Analyse expected traffic situation.	
2.3	**Familiarise with weather situation.**	Actual and forecast.
2.3.1	Consider own sector.	
2.3.2	Consider adjacent sectors.	
2.3.3	Consider relevant aerodromes.	
2.4	**Familiarise with relevant aerodrome conditions.**	
2.5	**Familiarise with airspace conditions.**	

DST3 Utilise Flight Plan Information

TASK		REMARKS
3.1	**Check flight plan data.**	
3.2	**Collate and prioritise relevant information and action.**	
3.3	**Evaluate information.**	
3.4	**Check, update and monitor flight progress information.**	

DST4 Ensure Appropriate Coordination

TASK		REMARKS
4.1	**Coordinate relevant data.**	
4.1.1	Coordinate within own area of responsibility.	
4.1.2	Coordinate with other areas of responsibility.	
4.1.3	Coordinate with shared airspace users.	
4.1.4	Coordinate with other agencies.	
4.2	**Notify controllers of abnormal situations that might affect coordination.**	Use all available means (e.g. ground-ground RTF).
4.3	**Delegate urgent coordination functions.**	Delegation to pilots.
4.3.1	Allocate priorities.	
4.3.2	Manage supporting staff.	

DST5 Manage Air Traffic within the Area of Responsibility

TASK		REMARKS
5.1	**Evaluate sector capacity.**	
5.1.1	Evaluate current traffic levels.	
5.1.2	Evaluate expected traffic levels.	

TASK		REMARKS
5.1.3	Consider airspace limitations.	Including use of flexible airspace procedures.
5.1.4	Consider limitations caused by weather.	
5.1.5	Consider navigational and equipment limitations.	
5.1.6	Consider human workload capacities.	
5.2	**Balance demand against sector capacity.**	
5.2.1	Apply tactical ATFM procedures.	
5.2.2	Apply strategic ATFM procedures.	

DST6 Update Working Knowledge

TASK		REMARKS
6.1	**Obtain proper briefing prior to assuming operational responsibilities.**	
6.2	**Be aware of system's performance and changes.**	

DST7 Conform with Medical Requirements

TASK		REMARKS
7.1	**Maintain required physical condition.**	
7.2	**Adhere to regulations against substance abuse.**	

7.2.3 Indirect Support Tasks (IST)

IST1 Report on Activities

TASK		REMARKS
1.1	**Keep the supervisor informed.**	
1.2	**Record relevant information.**	

IST2 Cooperate in Incident and Accident Investigation

TASK		REMARKS
2.1	**Collect/record relevant information on incidents and aircraft accidents.**	

8. FUTURE WORK

The advent of new systems, procedures and methodologies will be closely monitored. A biennial review of the documentation will be made in order to make recommendations on necessary amendments.

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ABBREVIATIONS AND ACRONYMS

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

ACC	Area Control Centre
ACP	Area Control Procedural
ACS	Area Control Surveillance
ADI	Aerodrome Control Instrument
ADS	Automatic Dependent Surveillance
ADV	Aerodrome Control Visual
AIP	Aeronautical Information Publication
APP	Approach Control (Procedural)
APS	Approach Control Surveillance
ADI/RAD	Aerodrome Radar Control
ASMGCS	Advanced Surface Movement Guidance and Control Systems
ATC	Air Traffic Control
ATCO	Air Traffic Controller / Air Traffic Control Officer *(US/UK)*
ATCS	Air Traffic Control Services
ATM	Air Traffic Management
ATS	Air Traffic Services
ATZ	Air Traffic Zone
CT	Core Task
DAP	Director(ate) ATM Programmes (*EUROCONTROL Headquarters, SD)*
DAS/HUM or just HUM	Human Factors Management Business Division *(EUROCONTROL Headquarters, SD, DAS)*

DAS	Director(ate) ATM Strategies *(EUROCONTROL Headquarters, SD)*
Doc	Document
DST	Direct Support Task
EATCHIP	European Air Traffic Control Harmonisation and Integration Programme *(later 'EATMP' and today 'EATM')*
EATM(P)	European Air Traffic Management (Programme) *(formerly 'EATCHIP')*
ECAC	European Civil Aviation Conference
ET	Executive Task *(EATCHIP)*
EU	European Union
GMC	Ground Movement Control
GMS	Ground Movement Surveillance
GUI	Guidelines *(EATCHIP/EATM(P))*
HRS	Human Resources Programme *(EATM(P))*
HRT	Human Resources Team *(EATCHIP/EATM(P))*
IANS	EUROCONTROL Institute of Air Navigation Services *(Luxembourg)*
ICAO	International Civil Aviation Organization
IFATCA	International Federation of Air Traffic Controllers' Associations
IFR	Instrument Flight Rules
IST	Indirect Support Task
LOA	Letter Of Agreement
LWG	Licensing Work Group *(EATCHIP/EATMP, HRT)*
OJT	On-the-Job Training
OJTI	On-the-Job Training Instructor
PANS	Procedures for Air Navigation Services *(ICAO)*

RAD	Radar
SARPs	Standards and Recommended Practices *(ICAO)*
SD	Senior Director, EATM Service Business Unit *(EUROCONTROL Headquarters)*
SMC	Surface Movement Control
SMGCS	Surface Movement Guidance and Control Systems
SMR	Surface Movement Radar
SRA	Surveillance Radar Approach
SSR	Secondary Surveillance Radar
ST	Specialist Task *(EATCHIP)*
S/VFR	Special Visual Flight Rules
TCL	Terminal Control
TDH Unit	Training Development and Harmonisation Unit *(EUROCONTROL, IANS)*
TF-CCC	Task Force Common Core Content *(EATCHIP/EATM(P), HRT, TSG/TFG)*
TMA	Terminal Area Control
TFG	Training Focus-Group *(EATM, HRT; formerly known as 'TSG')*
TSG	Training Sub-Group *(EATCHIP/EATMP, HRT; today known as 'TFG')*
TSP	Training Sub-Programme *(EATM(P), HRS)*
TWR	Tower (control)
VFR	Visual Flight Rules

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RATING TRAINING MODULES

Rating training modules are provided as separate documents for convenience (readers of the paper version will find them in the next section of the binder, while Internet surfers are referred to electronic files 2of9 to 9of9).

- **Module 1 - ADV - Aerodrome Control Visual Rating**
- **Module 2 - ADI - Aerodrome Control Instrument Rating**
- **Module 3 - ADI/RAD - Aerodrome Radar Control Endorsement**
- **Module 4 - APP - Approach Control Procedural Rating**
- **Module 5 - ACP - Area Control Procedural Rating**
- **Module 6 - APS - Approach Control Surveillance Rating with Radar Endorsement**
- **Module 7 - ACS - Area Control Surveillance Rating with Radar Endorsement**
- **Module 8 - TCL - Terminal Control Endorsement**

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