สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

GUIDANCE MATERIAL FOR COMPETENCY-BASED TRAINING AND ASSESSMENT (CBTA)

CAAT-GM-PEL-CBTA

Issue: 01

Revision: 00

Date: 01 September 2021

Approved by

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0. Introduction

0.1 Background

(a) The Procedures for Air Navigation Services — Training (PANS-TRG) are the result of the evolution of the work initiated by the Flight Crew Licensing and Training Panel (FCLTP) on the implementation of the training required for the pilot licences and ratings found in Annex 1 — Personnel Licensing, including the multi-crew pilot licence (MPL)

(b) The FCLTP, identified a clear need for licensing and training material that, although too detailed to take the form of Standards, was of sufficient importance to provide universal benefit to States. The need called for material that had to be harmonized and subjected to a formal consultation and approval process and that called for a higher level of adherence on the part of States than that required of guidance material. The FCLTP determined that the establishment of the PANS-TRG would be the appropriate document for use by all States.

(c) In 2011, following the work undertaken by the IATA Training and Qualifications Initiative on the development of a competency-based approach to the training and assessment of aircraft maintenance mechanics/technicians/engineers (AMMTEs), including those personnel with licensed or authorized privileges.

(d) There is industry-wide consensus that, in order to reduce aircraft hull loss and fatal accident rates, a strategic review of recurrent training for airline pilots is necessary. Consequently, procedures for evidence-based training (EBT), developed by the IATA Training and Qualifications Initiative, were introduced to the PANS-TRG issued in 2013 and are intended as a means of assessing and training key areas of flight crew performance in a recurrent training system. In addition, qualifications of the instructor were expanded.

(e) In 2015, the Next Generation of Aviation Professionals Task Force developed competency frameworks for air traffic controllers (ATCOs) and air traffic safety electronics personnel (ATSEP) to support the progressive implementation of competency-based training practices for air traffic management (ATM) personnel. This second edition of the PANS-TRG has been restructured and divided into different parts dealing with each category of personnel.

(f) The Competencies Task Force which was established in 2014 to review and clarify the existing competency-related definitions and concepts in provisions and organize them in a conceptual framework that would illustrate the relationships between the concepts.

0.2 Purpose

(a) This GM is providing guidance to Thai Approved Training Organisations (ATOs), Thai Approved Maintenance Training Organisations (AMTOs), Air operators and Air navigation service provider (ANSP) for the development and implementation of competency-based training and assessment programmes.

(b) This GM contains procedures for the development and implementation of various competency-based training programmes designed to meet the Annex 1 requirements for the MPL, the RPL and the AMMTE license, as well as those flight crew training programmes developed under the EBT concept, which provides an alternative means of satisfying the recurrent training requirements of Annex 6 — Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes.

0.3 Applicability

This GM applies to Thai ATOs providing training leading to the issuance of a Commercial Pilot License (CPL), Multi-Crew Pilot License (MPL), endorsement of a type rating, and AMTOs AMMTEs license and ATM personnel. This GM also applies to Thai AOC holders conducting in their Flight crew recurrent training programme for type-rated pilots and Air operators and Air navigation service provider (ANSP) for the development and implementation of competency-based training and assessment programmes.

0.4 Reference

(a) ICAO Annex 1 and Annex 6 Part 1;

(b) ICAO Doc 9868 Training Third Edition, 2020

(c) Easy Access Rules for Flight Crew Licensing (Part-FCL) Auguest2020

(d) ICAO Instructor Competency Framework (ICAO 2014 TRAINAIR PLUS)

(e) ICAO Doc 9995 Manual of Evidence-based Training

(f) ICAO Doc 9379 Chapter 9 Competency - Based Training and Assessment

1. General Procedures

This section contains three topics:

(1) Contains the definitions and acronyms and their technical meanings as used in this document. In some cases, the terms are defined in other ICAO or EASA documents.

(2) Outlines the general provisions for competency-based training and assessment and outlines the general principles and procedures to be followed in the design and implementation of a competency-based approach to training and assessment. 1.2.9 provides general considerations that should be taken into account when implementing competency-based training and assessment programmes including the relationship between competencies and tasks. 1.2.10 describes knowledge, skills and attitudes. 1.2.8 provides a generic methodology to design competency-based training and assessment based on the ADDIE principles.

(3) Contains the qualifications to be held by course developers and instructors employed in a competency-based training and assessment programme.

1.1 Definitions and Acronyms

1.1.1 Definitions

Term	*Definition*
Adapted competency model	A group of competencies with their associated description and performance criteria adapted from an Competency framework that an organization uses to develop competency-based training and assessment for a given role
Approved maintenance training organization (AMTO)	An approved training organization performing training for aircraft maintenance technicians/engineers/mechanics
Approved training organization (ATO)	An organization approved by and operating under the supervision of a Contracting State in accordance with the requirements of Annex 1 to perform approved training
Assessment	The determination by an instructor, assessor or evaluator as to whether a candidate meets a required competency standard under given conditions, by collecting evidence from observable

Term	*Definition*
	behaviours. Assessment takes place during instruction and evaluation.
Assessment (evidence) guide	A guide that provides detailed information (e.g. tolerances) in the form of evidence that an instructor or an evaluator can use to determine whether a candidate meets the requirements of the competency standard
Competency	A dimension of human performance that is used to reliably predict successful performance on the job. A competency is manifested and observed through behaviours that mobilize the relevant knowledge, skills and attitudes to carry out activities or tasks under specified conditions.
Competency (FCL.010)	A combination of skills, knowledge and attitude required to perform a task to the prescribed standard.
Competency-based training and assessment	Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.
Competency element (FCL.010)	An action which constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.
Competency framework	A competency framework, is a selected group of competencies for a given aviation discipline. Each competency has an associated description and observable behaviours.
Competency standard	A level of performance that is defined as acceptable when assessing whether or not competency has been achieved
Competency unit (FCL.010)	A discrete function consisting of a number of competency elements.
Criterion-referenced test	A test, the measurement of which is compared with an objective standard (and not against another measurement)

Term	*Definition*
Dispatch deviation procedures guide (DDPG)	Manual to identify any procedure to dispatch an aircraft with allowable systems/components inoperative or missing *Note. — Large aircraft manufacturers may choose to produce operating and maintenance procedures in documents such as dispatch deviation procedure guides, for use by operators*
Error	An action or inaction by an operational person that leads to deviations from organizational or the operational person' s intentions or expectations *Note — See Chapter 1 of Annex 19 —* Safety Management *for a description of operational personnel*
Error managemen	The process of detecting errors and responding to them with countermeasures that reduce or eliminate the consequences of errors and mitigate the probability of further errors or undesired states
Evaluator	A person authorized to conduct the formal and final summative assessment of a trainee's performance
Event	A combination of a task or a sub-task and the conditions under which the task or sub-task is to be performed
Facilitation technique	An active training method, which uses effective questioning, listening and a non- judgmental approach and is particularly effective in developing skills and attitudes, assisting trainees to develop insight and their own solutions and resulting in better understanding, retention and commitment
Generic standard shop practices manual	Manual that has been developed by an operator or by an approved maintenance organization that provides guidance and direction to shop personnel with respect to all aspects of in-house procedures as applied to the various maintenance and maintenance support activities that has been accepted or approved by the regulator for the scope of activities for that organization
Generic standard storage practices manual	Manual that has been developed by an operator or by an approved maintenance organization that provides guidance and direction to maintenance support personnel engaged in the storage and preservation of aircraft parts, components and other materials used in aircraft maintenance activities. The scope of the manual forms

Term	*Definition*
	part of the organization's accepted or approved maintenance programme as indicated by the regulator
Human factors principles	Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance
Human performance	Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations
Instructional systems design (ISD)	A formal process for designing training which includes analysis, design and production, and evaluation
Large aeroplane	An aeroplane of a maximum certificated take-off mass of over 5 700 kg
Maintenance	The performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft, engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair
Maintenance defect reporting sheet	Used by aircraft maintenance personnel to report any defects and malfunctions being found during aircraft inspections
Maintenance organization's procedures manual	A document endorsed by the head of the maintenance organization which details the maintenance organization's structure and management responsibilities, scope of work, description of facilities, maintenance procedures and quality assurance or inspection systems
Maintenance programme	A document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies
Maintenance record	Record that sets out the details of the maintenance carried out on an aircraft, engine, propeller or associated part
Maintenance release	A document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner, in accordance with appropriate airworthiness requirements

Term	*Definition*
Master minimum equipment list (MMEL)	A list established for a particular aircraft type by the organization responsible for the type design with the approval of the State of Design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight. The MMEL may be associated with special operating conditions, limitations or procedures
Minimum equipment list (MEL)	A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type
Modification	A change to the type design of an aircraft, engine or propeller. *Note. — A modification may also include the embodiment of the modification which is a maintenance task subject to a maintenance release. Further guidance on aircraft maintenance – modification and repair is contained in the* Airworthiness Manual *(Doc 9760)*
Monitoring	A cognitive process to compare an actual to an expected state
Observable behaviour (OB)	A single role-related behaviour that can be observed and may or may not be measurable
Performance criteria	Performance criteria
Performance criteria (FCL.010)	A simple, evaluative statement on the required outcome of the competency element and a description of the criteria used to judge if the required level of performance has been achieved.
Remote pilot station (RPS)	The component of the remotely piloted aircraft system containing the equipment used to pilot the remotely piloted aircraft
*Remotely piloted aircraft (RPA)**	An unmanned aircraft which is piloted from a remote pilot station
*Remotely piloted aircraft system (RPAS)**	A remotely piloted aircraft, its associated remote pilot stations, the required command and control links and any other components as specified in the type design
Scenario (event-set)	Relatively independent segment of training made up of several events

Term	*Definition*
Standard parts	Parts, such as fasteners, which are considered as approved parts when in accordance with a national or industry accepted standard and when referenced in the type design of the particular aircraft
Standard practices manual	Manual establishing standard practices to be applied by aircraft and component maintenance personnel for the proper handling (identification, application, working procedures, use of tools, and quality standards) of standard aeronautical hardware
Standard wiring practices manual (SWPM)	Manual establishing standard practices for processes in relation to any wiring used in aeronautical equipment to be applied by aircraft and component maintenance personnel for proper handling (identification, application, working procedures, use of tools and quality standards)
Threat	Events or errors that occur beyond the influence of an operational person, increase operational complexity and must be managed to maintain the margin of safety. *Note.— See Chapter 1 of Annex 19 —* Safety Management *for a description of operational personnel*
Threat management	The process of detecting threats and responding to them with countermeasures that reduce or eliminate the consequences of threats and mitigate the probability of errors or undesired states

1.1.2 Acronyms

Acronyms / Abbreviations	*Meaning*
AD	Airworthiness directive
ADDIE	Analyse, design, develop, implement and evaluate
AMM	Aircraft maintenance manual
AMO	Approved maintenance organization
AMTEM	Aircraft maintenance technician/engineer/mechanic
AMTO	Approved maintenance training organization
ANSP	Air navigation services provider
ATC	Air traffic control
ATCO	Air traffic controller
ATM	Air traffic management
ATO	Approved training organization
ATSEP	Air traffic safety electronics personnel
BITE	Built-in test equipment
CAA	Civil aviation authority
CB-IR	Competency-based training course for Instrument Rating
CBTA	Competency-based training and assessment
CE	Competency element
CMM	Component maintenance manual
CPL(A)	Commercial pilot licence (aeroplane)
CRM	Crew resource management
CRS	Certificate of return to service
DDPG	Dispatch deviation procedures guide
EBT	Evidence-based training

Acronyms / Abbreviations	*Meaning*
FIM	Fault isolation manual
FOO	Flight operations officer/flight dispatcher
FSTD	Flight simulation training device
ICAs	Instruction for continued airworthiness
IOE	Initial operating experience
ISD	Instructional systems design
KSA	Knowledge, skills and attitudes
LOC-I	Loss of control in flight
LOSA	Line operations safety audit
LWTR	Licence without type rating (an aircraft maintenance technician/engineer/mechanic licence)
MEL	Minimum equipment list
MM	Maintenance manual
MMEL	Master minimum equipment list
MOPM	Maintenance organization's procedures manual
MPL	Multi-crew pilot licence
MRM	Maintenance resource management
NDT	Non-destructive testing
OB	Observable behaviour
OEM	Original equipment manufacturer
OJT	On-the-job training
OJTI	On-the-job training instructor
PC	Performance criteria
QA	Quality assurance

Acronyms / Abbreviations	*Meaning*
QS	Quality system
RPA2	Remotely piloted aircraft
*RPAS**	Remotely piloted aircraft system
*RPL**	Remote pilot licence
*RPS**	Remote pilot station
SARPs	Standards and Recommended Practices
SMPM	Special maintenance procedures manual
SMS	Safety management system
SOP	Standard operating procedure
SPM	Standard practices manual
SRM	Structural repair manual
SWPM	Standard wiring practices manual
TEM	Threat and error management
TR	Type rating (on an aircraft maintenance technician/engineer/mechanic licence)
UPRT	Upset prevention and recovery training

1.2 General Provisions for Competency-Based Training and Assessment

1.2.1 Introduction

1.2.1.1 The goal of competency-based training and assessment is to provide a competent workforce for the provision of a safe and efficient air transportation system. In order to focus training and assessment on how an aviation professional is expected to competently perform on the job, a description of this performance in the particular operational and environmental context is needed. The adapted competency model, with its associated performance criteria, provides a means of assessing whether trainees achieve the desired performance.

1.2.1.2 The provisions in this chapter:

(a) describe the relationships between key concepts in competency-based training and assessment;

(b) outline the general principles and procedures to be followed in the design and implementation of competency-based training and assessment; and

(c) are applicable to all subsequent chapters of this document.

1.2.1.3 The competency frameworks in this document, are generic models. Organizations implementing competency-based training and assessment in a given aviation discipline shall adapt the corresponding competency frameworks to reflect their specific local environment and requirements. Additional considerations to be taken into account when implementing a competency-based training and assessment approach can be found **1.2.9**

1.2.2 Principles of Competency-Related Training and Assessment

1.2.2.1 Relevant competencies are clearly defined for a particular role within an aviation discipline.

1.2.2.2 There is an explicit link between competencies and training, required performance on the job, and assessment.

1.2.2.3 Competencies are formulated in a way that ensures they can be trained for, observed and assessed consistently in a wide variety of work contexts for a given aviation profession or role.

1.2.2.4 Trainees successfully demonstrate competency by meeting the associated competency standard.

1.2.2.5 Each stakeholder in the process including the trainee, instructor, training organization, operator, service provider and regulator has a common understanding of the competency standards.

1.2.2.6 Clear performance criteria are established for assessing competence.

1.2.2.7 Evidence of competent performance is valid and reliable.

1.2.2.8 Instructors' and assessors' judgements are calibrated to achieve a high degree of inter-rater reliability.

1.2.2.9 Assessment of competencies is based on multiple observations across multiple contexts.

1.2.2.10 To be considered competent, an individual demonstrates an integrated performance of all the required competencies to a specified standard.

1.2.3 Assumptions

In this document, it is assumed that:

1.2.3.1 all tasks performed by an aviation professional require the application of a relevant set of competencies;

1.2.3.2 competencies are defined for each aviation function/profession/role (pilots, cabin crew, air traffic controllers, air traffic safety electronics personnel, designated medical examiners, dispatchers, etc.) and applied to the individual; and

1.2.3.3 aviation professionals apply a set of competencies in a given role throughout their career (e.g. private, commercial, multi-crew and airline transport pilots will demonstrate the same set of competencies but with different degrees of performance)

1.2.4 Structure of a Competency Framework

1.2.4.1 In a competency framework is structured as shown **Table 1-1.**

Table 1-1 Structure of a competency framework

Competency	*Description*	*Observable Behaviour (OB)*
Competency 1	Description 1	OB 1
		OB 2
		OB n
Competency 2	Description 2	OB 1
		OB 2
		OB n
Competency n	Description n	OB 1
		OB 2
		OB n

1.2.4.2 The subsequent parts of this document contain competency frameworks for the different aviation disciplines. For example, one of the competencies for an air traffic controller in the competency framework is “communication” and can be described and broken down in observable behaviours as shown in Table 1-2.

Table 1-2 Example of a competency framework

Competency	*Description*	*Observable Behaviour (OB)*
Communication	Communicate effectively in All operational situations	Selects communication mode that takes into account the requirements of the situation
		Speaks clearly, accurately and concisely
		Uses appropriate vocabulary and expressions to convey clear messages
		Uses standard radiotelephony (RT) phraseology
		Adjusts speech techniques to suit the situation
		Demonstrates active listening and provides feedback
		Uses plain language when RT phraseology does not exist or the situation requires it

Competency	*Description*	*Observable Behaviour (OB)*
		Uses eye contact, body movements and gestures that are consistent with verbal messages

1.2.5 Structure of Adapted Competency Models

The purpose of competency-based training and assessment is to train and assess the capacity of an individual to perform at the standard expected in an organizational workplace. Therefore, organizations electing to implement competency-based training and assessment in a discipline covered in this document shall adapt the corresponding competency framework to suit their context by developing an adapted competency model to include the elements in Table 1-3.

Table 1-3. Elements of an adapted competency model

Adapted competency	*Description*	*Performance criteria*		
		Observable	*Competency assessment*	
Adapted competency 1	Description 1	OB 1	Final competency standard	Conditions
		OB 2		
		OB n		
Adapted competency 2	Description 2	OB 1		
		OB 2		
		OB n		
Adapted competency n	Description n	OB 1		
		OB 2		
		OB n		

1.2.6 Components of a Competency-Based Training and Assessment Programme

1.2.6.1 A training specification describes the purpose of training, the task list and the requirements that shall be fulfilled when designing the training.

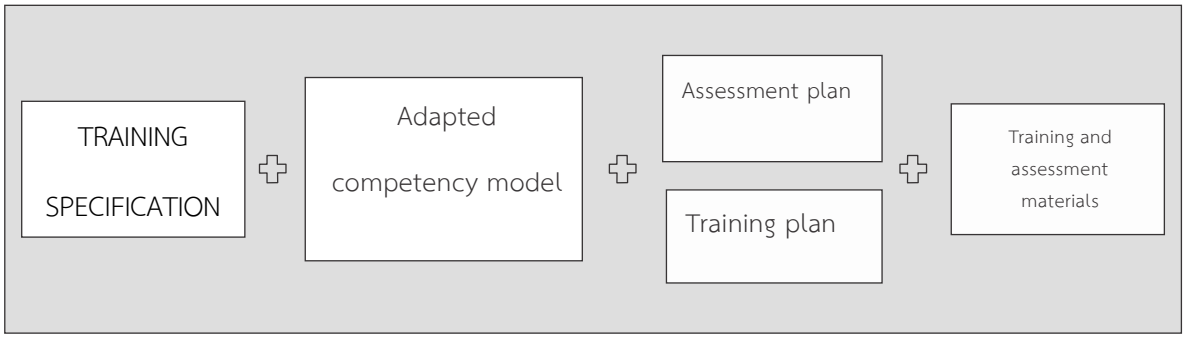
1.2.6.2 An adapted competency model is a group of competencies with their associated description and performance criteria adapted from competency framework that an organization uses to develop competency-based training and assessment for a given role.

1.2.6.3 An assessment plan provides the process and tools for gathering valid and reliable evidence at different stages during training.

1.2.6.4 A training plan describes the training required to achieve the competencies. It includes but is not limited to a syllabus (including knowledge, skills and attitudes (KSA), milestones, lesson plans and schedules). See 1.2.10 for a description of KSA.

1.2.6.5 Training and assessment materials and resources (i.e. human, material and organizational resources) include everything needed to implement training and assessment plans.

1.2.6.6 Figure 1-4 illustrates the various components needed to build a competency-based training and assessment programme.

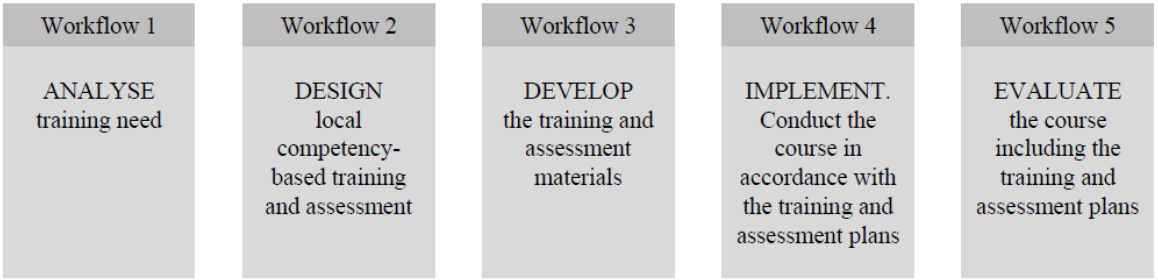


1.2.7 Instructional Systems Design

It is recognized that there are several valid instructional systems design (ISD) models that may be used to design competency-based training and assessment. They can serve as a basis to derive the components of competency-based training and assessment as described above. The analyse, design, develop, implement and evaluate (ADDIE) framework is generic to all ISD models.

1.2.8 Overview of Competency-Based Training and Assessment Workflows

The five competency-based training and assessment workflows using the ADDIE model are presented in **Figure 1-5.**



The workflows relate to the components of competency-based training and assessment programmes Workflows 1 and 2 establish the training specification, adapted competency model, assessment plan and training plan that will be used to develop and conduct the training course (as outlined in Workflows 3 and 4). Workflow 5 reviews the effectiveness of the training and assessment conducted and recommends improvements, as appropriate.

Procedural methods are used for workflows 1 to 5 and their details can be found in the ICAO DOC9868 Third Edition, 2020 Attachment C to Chapter 2 DESIGN OF COMPETENCY-BASED TRAINING AND ASSESSMENT

1.2.9 General Considerations Related to Competency-Based Assessment

1.2.9.1 Benefits of competency-based training and assessment

The main benefit of a competency-based approach to training and assessment is its potential to encourage and enable individual aviation professionals to reach their highest level of operational capability while ensuring a basic level of competence as a minimum standard.

1.2.9.2 Challenges

The evolution in the understanding of how people learn and the growing complexity resulting from the introduction of new technologies and operating methods present continuous challenges to the approach to training, especially within limited timeframes and budgets. Some of these challenges are to:

(a) ensure that what is trained is relevant to the job;

(b) achieve a more effective ratio between learning opportunities and checking/assessment. This implies a shift towards more learning opportunities;

(c) ensure the integration of knowledge, skills and attitudes (KSA) needed to perform effectively;

(d) ensure that the full potential of training tools and methodologies is exploited;

(e) support continuous learning and performance improvement over the span of an aviation professional’s career;

(f) achieve transfer of KSA across contexts and operational situations; and

(g) establish sufficient, well-trained and competent teacher/instructor. Competency-based training and assessment can be used to address many of these challenges.

1.2.9.3. Relationship between competencies and tasks

1. 2. 9. 3. 1 Traditional approaches to training development involve the decomposition of jobs into tasks. For each task there is a related objective, an assessment and associated elements in a training plan. A limitation of this approach is that each task must be taught and assessed. In complex systems or when jobs evolve rapidly, it may not be possible to teach and assess each task. Moreover, learners may demonstrate the ability to perform tasks in isolation without being competent in their job.

1. 2. 9. 3. 2 Competency- based training and assessment is based on the concept that competencies are transferable. In the design of a competency-based training and assessment programme, a limited number of competencies are defined. Typically, an activity will involve several competencies and competencies apply across a variety of activities and contexts. In the design of training and assessments, tasks and activities are incorporated because they are good candidates for facilitating, developing or assessing a competency or competencies. Specific tasks may be used to develop specific competencies. Lack of specific competencies may be identified as root causes of the failure of the performance of a task.

1.2.9.4. Best practices that support competency-based approaches to training and assessment

To gain the maximum value and achieve efficiencies, competency-based approaches should incorporate training best practices as follows:

(a) organizations encourage and support learning in formal and informal settings at different stages in an aviation professional's work life;

(b) training programmes focus on the quality of what trainees do and achieve during training rather than on the prescribed amount of time aviation professionals spend training;

(c) training focuses on accommodating an individual trainee's needs and provides flexibility; and

(d) the highest quality and level of consistency of instruction is provided and particular attention is given to coaching, facilitation and mentoring.

1.2.10 Knowledge, Skills and Attitudes

1.2.10.1. General

In order to display certain observable behaviors and demonstrate the achievement of performance criteria, aviation professionals call on relevant knowledge, skills and attitudes (KSA)

appropriate to a specific role and context. This ability will vary depending on the level of experience and expertise of the aviation professional.

1.2.10.2. Knowledge

1.2.10.2.1 Knowledge is specific information required to enable a learner to develop and apply the skills and attitudes to recall facts, identify concepts, apply rules or principles, solve problems, and think creatively in the context of work.

1.2.10.2.2 Knowledge is an outcome of the learning process, whether learning occurs in formal or informal settings. There are different types of knowledge: declarative (e.g. facts and raw data), procedural (e.g. categorized/ contextualized and application of conditional if-then rules), strategic (e.g. synthesis, inference to guide resource allocation for decision making, problem solving and behavioral action), and adaptive (e.g. generalization, innovation and invention).

1.2.10.3. Skills

1.2.10.3.1 A skill is an ability to perform an activity or action. It is often divided into three types: motor, cognitive and metacognitive skills.

1.2.10.3.2 A motor skill is an intentional movement, involving a motor or muscular component, that must be learned and voluntarily produced to proficiently perform a goal-oriented task.

1.2.10.3.3 A cognitive skill is any mental skill used in the process of acquiring knowledge, such as reasoning, perception and intuition.

1.2.10.3.4 A metacognitive skill relates to the ability of learners to monitor and direct their own learning processes (“thinking about thinking”); for example, planning how to approach a given learning task, monitoring comprehension and evaluating progress toward the completion of a task.

1.2.10.4. Attitudes

Attitude is a persistent internal mental state or disposition that influences an individual’s choice of personal action toward some object, person or event and that can be learned. Attitudes have affective components, cognitive aspects and behavioral consequences. To demonstrate the “right” attitude, a learner needs to “know how to be” in a given context.

1.3 Course Developers and Qualifications of Instructors

Note 1. A competency framework for pilot instructors and evaluators is contained in 2.1

1.3.1 Course Developers

Course developers shall have demonstrated that they are able to develop training in accordance with the principles of a competency-based approach to training, as outlined in 1.2.2 Principles of competency-based training and assessment.

1.3.2 Instructor Qualifications

1.3.2.1 Instructors shall hold or have held a license and be authorized to carry out instruction on the basis of their expertise and/or qualifications and/or ratings.

Note 1. Authorization to carry out instruction will take into account CAAT regulation instructor rating, authorization or qualification requirements, when applicable.

Note 2. The above requirement does not preclude a non-licensed technical specialist from being authorized by the appropriate authority to instruct on subject matters that deal with systems operation or procedural requirements in any training environment or media.

1.3.2.2 Prior to an organization authorizing the provision of instruction, instructors should undergo a selection process designed to ensure the individual's motivation and disposition are suitable for the instructor's role.

1.3.2.3 Prior to an organization authorizing the provision of instruction, instructors should successfully complete a formal instructor competency assessment during the conduct of practical training. During the assessment, the instructor should consistently demonstrate the required competencies according to the relevant adapted competency model.

1.3.2.4 All instructors should receive refresher training, and be reassessed according to 1.3.2.3 using a documented training and assessment process acceptable to the appropriate authority, implemented by a certificated or approved organization and at intervals established by the authority. Such refresher training and reassessment intervals shall not be greater than three years.

1.3.2.5 Qualified and authorized instructors may be assigned to carry out specific assessment, checking and/or testing duties to determine that all required performance criteria have been satisfactorily achieved. These performance criteria may have been established as a final objective or required to be met on a continuous basis. In either case, the instructor is responsible for making a determination of the level of competence achieved and any

recommendation for immediate remediation, if necessary. Qualified instructors/ assessors/ evaluators may be assigned to determine the final level of competence of a candidate.

2. Training and Assessment for Aircraft Operational Personnel

This part provides guidance on the training and assessment for aircraft operational personnel, including flight crew, cabin crew and flight operations officers/flight dispatchers. 2.1 introduces the training and assessment for flight crew. 2.1.1 outlines the competency framework for aeroplane pilots. 2.1.2 outlines the principles and procedures for competency-based training and assessment for the multi-crew pilot licence (MPL). 2.1.3 covers evidence-based training (EBT). 2.1.4 contains procedures for competency-based training and assessment for the type rating. 2.1.5 outlines the competency framework for pilot instructors and evaluators. 2.1.6 outlines the principles and procedures for competency-based training and assessment for the remote pilot licence (RPL).

2.1 Flight Crew Training and Assessment

2.1.1 Competency Framework for Aeroplane Pilots

2.1.1.1 Introduction

2.1.1.1.1 This chapter provides the procedures for establishing a competency-based training and assessment programme for aeroplane pilots, with which approved training organizations (ATOs), air operators and Authorities shall comply when implementing such a programme.

2.1.1.1.2 *An approved training organization* may offer to Licensing Authorities the option to apply a competency-based approach to training for private and commercial pilot licences and instrument rating as an alternative means of compliance to experience requirements in accordance with the particular provisions in Annex 1. Competency-based training and assessment for the type rating is not directly addressed in Annex 1 but is one means to satisfy the requirements for the issue of a type rating. A competency-based approach is an Annex 1 requirement for multi-crew pilot licence training programmes.

2.1.1.1.3 The competency framework for aeroplane pilots defined in 2.1.1.2 shall be used by the ATO or the operator as the basis for the development of an adapted competency model, approved by the Licensing Authority, for pilot licences and ratings in accordance with 1.2 The Competency Framework for Aeroplane Pilots is applicable to all aeroplane pilot licences and/or ratings. The instructor rating or authorization will require additional competencies. A designated pilot examiner will also require additional competencies These competencies are included in Chapter 6 of ICAO DOC 9868 (Threat and error management).

2.1.1.1.4 In addition, the competency framework for aeroplane pilots can be applied to recurrent assessment and training to comply with the requirements of Annex 6 —

Operation of Aircraft, Part I, *International Commercial Air Transport — Aeroplanes*, 9.3, *Flight crew member training programmes* and 9.4.4, *Pilot proficiency checks*.

2.1.1.1.5 It may also be applied for approved training organizations and operators engaged in the recurrent training and assessment of flight crew operating large or turbojet aeroplanes in accordance with Annex 6, Part II — *International General Aviation — Aeroplanes*.

2.1.1.1.6 Competency-based training and assessment programmes for aeroplane pilots shall include all components identified in 1.2.6.

2.1.1.1.7 An ISD methodology shall be applied in the design of competency-based training and assessment programmes as per 1.2.

2.1.1.1.8 The ATO shall develop the assessment process, approved by the Licensing Authority, in accordance with 1.2.

2.1.1.1.9 The applicant shall meet the requirements of the approved competency-based training and assessment programme before the appropriate aeroplane pilot licence or rating can be issued.

2.1.1.1.10 Application of Knowledge

2.1.1.1.10.1 Underpinning the pilot competencies is the 'application of knowledge' which collectively refers to the ability of the pilot to:

* recall and proactively update relevant knowledge; and

* apply acquired knowledge to the operational environment, including TEM.

2.1.1.1.10.2 Throughout all phases of pilot training, an operator or ATO must progressively develop, assess and debrief the trainees on their application of knowledge, recording at least strengths, weaknesses and any remedial action.

2.1.1.1.10.3 The training and evaluation for 2.1.1.1.10.2 should be conducted to meet the training objective, using a range of methods which have been developed using an instructional system design method (e.g. ADDIE). The training and evaluation should be described in the approved relevant manual(s) and subject to operator or ATO course review and update action.

2.1.1.1.10.4 Where the effect of a trainee's knowledge impacts on an observable behavior within a pilot competency, this should also be reflected in the review of that competency and be debriefed in the context of that competency.

2.1.1.2 Competency Framework to Develop Competency-Based Training and Assessment for Aeroplane Pilot Licences, Ratings, And Recurrent Training

Note 1. The competencies and observable behaviours in the table are not listed according to any pre-defined priority. Observable behaviours may include but are not limited to the observable behaviours listed in the table below.

Note 2. Observable behaviours are performed to a criterion, e.g. accurately or correctly, generally not stated.

Competency	*Description*	*Observable behaviours (OB)*
Application of procedures and compliance with regulations	Identifies and applies appropriate procedures in accordance with published operating instructions and applicable regulations	OB 1.1 Identifies where to find procedures and regulations OB 1.2 Applies relevant operating instructions, procedures and techniques in a timely manner OB 1.3 Follows SOPs unless a higher degree of safety dictates an appropriate deviation OB 1.4 Operates aeroplane systems and associated equipment correctly OB 1.5 Monitors aircraft systems status OB 1.6 Complies with applicable regulations OB 1.7 Applies relevant procedural knowledge

Competency	*Description*	*Observable behaviours (OB)*
Communication	Communicates through appropriate means in the operational environment, in both normal and non-normal situations	OB 2.1 Determines that the recipient is ready and able to receive information OB 2.2 Selects appropriately what, when, how and with whom to communicate OB 2.3 Conveys messages clearly, accurately and concisely OB 2.4 Confirms that the recipient demonstrates understanding of important information OB 2.5 Listens actively and demonstrates understanding when receiving information OB 2.6 Asks relevant and effective questions OB 2.7 Uses appropriate escalation in communication to resolve identified deviations OB 2.8 Uses and interprets non-verbal communication in a manner appropriate to the organizational and social culture OB 2.9 Adheres to standard radiotelephone phraseology and procedures OB 2.10 Accurately reads, interprets, constructs and responds to datalink messages in English

Competency	*Description*	*Observable behaviours (OB)*
Aeroplane Flight Path Management, automation	Controls the flight path through automation	OB 3.1 Uses appropriate flight management, guidance systems and automation, as installed and applicable to the conditions (see Part I, Chapter 1, for the definition of conditions) OB 3.2 Monitors and detects deviations from the intended flight path and takes appropriate action OB 3.3 Manages the flight path safely to achieve optimum operational performance OB 3.4 Maintains the intended flight path during flight using automation while managing other tasks and distractions OB 3.5 Selects appropriate level and mode of automation in a timely manner considering phase of flight and workload OB 3.6 Effectively monitors automation, including engagement and automatic mode transitions

Competency	*Description*	*Observable behaviours (OB)*
Aeroplane Flight Path Management, manual control	Controls the flight path through manual control	OB 4.1 Controls the aircraft manually with accuracy and smoothness as appropriate to the situation OB 4.2 Monitors and detects deviations from the intended flight path and takes appropriate action OB 4.3 Manually controls the aeroplane using the relationship between aeroplane attitude, speed and thrust, and navigation signals or visual information OB 4.4 Manages the flight path safely to achieve optimum operational performance OB 4.5 Maintains the intended flight path during manual flight while managing other tasks and distractions OB 4.6 Uses appropriate flight management and guidance systems, as installed and applicable to the conditions (See Part I, Chapter 1, definitions) OB 4.7 Effectively monitors flight guidance systems including engagement and automatic mode transitions

Competency	*Description*	*Observable behaviours (OB)*
Leadership and Teamwork	Influences others to contribute to a shared purpose Collaborates to accomplish the goals of the team	OB 5.1 Encourages team participation and open communication OB 5.2 Demonstrates initiative and provides direction when required OB 5.3 Engages others in planning OB 5.4 Considers inputs from others OB 5.5 Gives and receives feedback constructively OB 5.6 Addresses and resolves conflicts and disagreements in a constructive manner OB 5.7 Exercises decisive leadership when required OB 5.8 Accepts responsibility for decisions and actions OB 5.9 Carries out instructions when directed OB 5.10 Applies effective intervention strategies to resolve identified deviations OB 5.11 Manages cultural and language challenges, as applicable
Problem-solving and decision-making	Identifies precursors, mitigates problems; and makes decisions	OB 6.1 Identifies, assesses and manages threats and errors in a timely manner OB 6.2 Seeks accurate and adequate information from appropriate sources OB 6.3 Identifies and verifies what and why things have gone wrong, if appropriate OB 6.4 Perseveres in working through problems while prioritizing safety OB 6.5 Identifies and considers appropriate options OB 6.6 Applies appropriate and timely decision- making techniques OB 6.7 Monitors, reviews and adapts decisions as required OB 6.8 Adapts when faced with situations where no guidance or procedure exists OB 6.9 Demonstrates resilience when encountering an unexpected event

Competency	*Description*	*Observable behaviours (OB)*
Situational awareness and management of information	Perceives, comprehends and manages information and anticipates its effect on the operation	OB 7.1 Monitors and assesses the state of the aeroplane and its systems OB 7.2 Monitors and assesses the aeroplane's energy state, and its anticipated flight path OB 7.3 Monitors and assesses the general environment as it may affect the operation OB 7.4 Validates the accuracy of information and checks for gross errors OB 7.5 Maintains awareness of the people involved in or affected by the operation and their capacity to perform as expected OB 7.6 Develops effective contingency plans based upon potential risks associated with threats and errors OB 7.7 Responds to indications of reduced situational awareness
Workload management	Maintains available workload capacity by prioritizing and distributing tasks using appropriate resources	OB 8.1 Exercises self-control in all situations OB 8.2 Plans, prioritizes and schedules appropriate tasks effectively OB 8.3 Manages time efficiently when carrying out tasks OB 8.4 Offers and gives assistance OB 8.5 Delegates tasks OB 8.6 Seeks and accepts assistance, when appropriate OB 8.7 Monitors, reviews and cross-checks actions conscientiously OB 8.8 Verifies that tasks are completed to the expected outcome OB 8.9 Manages and recovers from interruptions, distractions, variations and failures effectively while performing tasks

2.1.2 Competency-Based Training and Assessment for the Multi-Crew Pilot Licence (MPL)

[Reserved]

2.1.3 Evidence-Based Training (EBT)

Until 2 November 2022, this chapter is intended to provide guidance to civil aviation authorities, operators and approved training organizations in the recurrent training of pilots. As of 3 November 2022, this chapter is intended to provide guidance to civil aviation authorities, operators and approved training organizations in the recurrent training of pilots and remote pilots.

2.1.3.1 APPLICABILITY

2.1.3.1.1 This chapter, supported by the Manual of Evidence-based Training (Doc 9995), is intended to describe procedures that civil aviation authorities, operators and approved training organizations shall comply with when implementing competency-based recurrent training and assessment of aeroplane pilots also referred to as evidence-based training (EBT). Recurrent training is referred to in Annex 6 — Operation of Aircraft, Part I, International Commercial Air Transport — Aeroplanes, 9.3 — Flight crew member training programmes and 9.4.4 — Pilot proficiency checks.

2.1.3.1.2 It may also provide guidance for approved training organizations engaged in the recurrent training and assessment of flight crew engaged in the operations of large or turbojet aeroplanes in accordance with Annex 6, Part II — International General Aviation — Aeroplanes (section 3 refers).

2.1.3.1.3 EBT is optional and is an alternative means of training and assessing key areas of flight crew performance in a recurrent training system.

2.1.3.1.4 EBT is based on an approved adapted competency model derived from the competency framework for aeroplane pilots in Part II, Section 1, Chapter 1, using the methodology in Part I, Chapter 2.

2.1.3.1.5 The aim of EBT is to develop, maintain and assess the competencies required to operate safely, effectively and efficiently in a commercial air transport environment, while addressing the most relevant threats according to evidence collected in accidents, incidents, flight operations and training.

2.1.3.1.6 Demonstration of the competencies can be assessed using the observable behaviours, which should meet the required level of performance, described in the performance criteria established by the operator for its specific operation. Observable behaviours may include but are not limited to the observable behaviours listed in the competency framework for aeroplane pilots (2.1.1)

2.1.3.1.7 The Manual of Evidence-based Training (Doc 9995) provides guidance for the development of EBT programmes in addition to information for instructors

conducting the training. It is assumed that the EBT training and assessment will be conducted in FSTDs qualified to an appropriate level in accordance with civil aviation authority rules (Manual of Criteria for the Qualification of Flight Simulation Training Devices (Doc 9625) refers).

2.1.3.1.8 When choosing to implement EBT in their regulatory framework, as an alternative to the regulated traditional recurrent training and checking of airline pilots, States shall ensure that operators and training organizations apply the principles of Doc 9995 when developing and implementing such recurrent training programmes

2.1.3.2 BACKGROUND

2.1.3.2.1 The development of EBT arose from an industry-wide consensus that, in order to reduce the aircraft hull loss and fatal accident rates, a strategic review of recurrent training for airline pilots was necessary. The availability of useful data covering both flight operations and training activity has improved substantially over the last 20 years. Data sources like flight data analysis, flight observation (e.g. line operations safety audit (LOSA)) and air safety reports give a detailed insight into the threats, errors and risks in flight operations and their relation to unwanted consequences. Training results demonstrate important differences in training needs between different manoeuvres and aircraft generations. Availability of such data has both established the need for the EBT effort and supported the definition of the resulting evidence-based training concept and curriculum.

2.1.3.2.2 The complexity of today's aviation system makes it impossible to foresee all scenarios. The system's complexity and high reliability mean that the next accident may be something completely unexpected. EBT addresses this by prioritizing the assessment and development of a finite number of competencies. Mastering competencies, rather than a prescribed set of events, should allow a pilot to manage unforeseen situations in flight thus developing flight crew resilience. The scenarios used in EBT are means to develop and assess these competencies.

2.1.3.3 EBT INSTRUCTION

2.1.3.3.1 Recognizing the critical role that instructors play in training, Doc 9995 provides specific additional guidance on the requirements for instructors delivering EBT. EBT, like any competency-based training and assessment, emphasizes a focus on the analysis of root causes of errors in order to take corrective actions.

2.1.3.3.2 It is recognized that in today's very high-fidelity simulator environment, there are very powerful training tools and yet some regulations are much more biased towards testing and checking, as opposed to training. EBT seeks to redress the balance

between training and checking, recognizing that an assessment of competence is necessary, but once completed, pilots learn most effectively when not under pure test conditions. Appropriate input by competent instructors will enable pilots to be trained to a given set of performance criteria for performing tasks and managing events effectively.

2.1.4 Competency-Based Training and Assessment of Pilots for The Type Rating

2.1.4.1 GENERAL PROVISIONS FOR CBTA OF PILOTS FOR THE TYPE RATING

2.1.4.1.1 Introduction

This chapter outlines the requirements to be met in order to implement CBTA of pilots for the type rating. Implementation of such training is, however, optional.

2.1.4.1.2 Applicability of CBTA for type rating

2.1.4.1.2.1 This chapter applies only to CBTA for the type rating in the aeroplane category.

2.1.4.1.2.2 CBTA for type rating may be implemented by an approved training organization (ATO) or an operator certified in accordance with Annex 6. This chapter provides the procedures, with which ATOs and operators must comply with when implementing a CBTA type rating programme. These procedures are complementary to those provided in 1.2

2.1.4.2 PROCEDURES FOR CBTA OF PILOTS FOR THE TYPE RATING

2.1.4.2.1 Adapted competency model

The competency framework for aeroplane pilots provided in 2.1.1 must be used to develop the adapted competency model for type rating.

2.1.4.2.2 Training and assessment

2.1.4.2.2.1 To be considered as qualified to conduct CBTA for type rating, the instructor/evaluator must meet the requirements of the pilot instructor and evaluator competency framework defined in 2.1.5

2.1.4.2.2.2 Guidance to Licensing Authorities, ATOs and operators on the measures to be taken to facilitate design, development and implementation of CBTA type ratings are defined in 2.1.4.3.

2.1.4.3 GUIDELINES FOR THE DESIGN, DEVELOPMENT AND IMPLEMENTATION OF COMPETENCY-BASED TYPE RATING

2.1.4.3.1. Introduction

Approved training organizations and operators may elect to develop a CBTA type rating.

Note. Detailed guidance on the principles of CBTA for pilots can be found in the Manual on Aeroplane Pilot Competency-based Training and Assessment (Doc xxxxx). (To be developed).

2.1.4.3.2. Course Design and Development

2.1.4.3.2.1 Course design must include the mandatory training elements or specific training requirements published by the original equipment manufacturer (OEM) or the State approving the course.

2.1.4.3.2.2 Course design should consider training design guidelines (if any) provided by the OEM and the State approving the course.

2.1.4.3.2.3 Course content must focus on the development of pilot competencies rather than focus on pure task orientated training.

2.1.4.3.2.4 Course design should require the use of representative training and simulation tools as early as possible in the training process in order to contextualize all pilot competencies.

2.1.4.3.2.5 CBTA type rating programmes should follow a progressive approach to achieve the final competency standard by initially acquiring the basic knowledge and skills for operation of the aircraft; then developing the competencies; and finally consolidating all competencies in conditions as close as possible to the real environment, in real-time (scenario based training/line orientated simulations).

2.1.4.3.2.6 The course design should group aircraft system malfunctions by reference to malfunction characteristics and the underlying elements of crew performance required to manage them. (Class of Equivalence principle or Equivalency of Malfunctions).

Note. Guidance on equivalency of malfunctions is contained in the Manual of Evidence-based Training (Doc 9995), Part I, 3.8.

2.1.4.3.2.7 The CBTA programme should integrate threat and error management and surprise elements throughout the complete course syllabus with an increase of these factors towards the end of the syllabus.

2.1.4.3.2.8 Course design should enable the instructor to apply a wide range of competency-based instructional techniques.

For details see the Manual on Aeroplane Pilot Competency-based Training and Assessment (Doc xxxxx). (To be developed).

2.1.4.3.2 Guidelines for the authority

2.1.4.3.2.1 Guidance material regarding the approval of the training and assessment plans of a CBTA programme, as well as the quality assurance and safety management system used by an ATO or an operator in implementing these programmes can be found in the Manual on the Approval of Training Organizations (Doc 9841).

2.1.4.3.2.2 One of the attributes of CBTA, as defined in this document, is the use of an ongoing process for the evaluation of the training programme. The licensing authority shall therefore ensure that the ATO or the operator continuously monitors the effectiveness of the training.

2.1.4.3.2.3 The need for regular feedback from the ATO or operator to the Licensing Authority on the progress and problems faced during and after the delivery of the first programme(s) is important. How this feedback is to be provided to the Licensing Authority should therefore be clearly stated as part of the approval.

2.1.5 The Pilot Instructor and Evaluator Competency Framework

2.1.5.1 Introduction

2.1.5.1.1 Pilot instructors shall meet the requirements specified in Annex 1, 2.1.8 Circumstances in which authorization to conduct instruction is required and Annex 1, 2.8 Flight instructor rating appropriate to aeroplanes, airships, helicopters and powered-lifts as appropriate. In addition, for the multi-crew pilot licence (MPL) training programme, the instructor shall have experience, acceptable to the Licensing Authority, in multi-crew operations, as follows:

(a) for at least the intermediate and advanced phases of the multi-crew pilot licence (MPL) programme, have suitable experience in multi-pilot operations; or

(b) with the exception of instructors providing instruction in the intermediate and advanced phases of the MPL licence, receive training as an alternative means of compliance with the experience prerequisite for instruction in multiplot operations. This training should include but may not be limited to the following elements:

(1) multi-crew cooperation training in a suitable multi-pilot flight simulation training device;

(2) observations of multi-pilot line operations with a suitable operator;

(3) observations of subsequent multi-pilot training where applicable; and

(4) completion of multi-pilot cockpit resource management training.

2.1.5.1.2 The benefit of using competencies for the pilot instructor and evaluator, and some explanation on the terms used, are described below.

2.1.5.1.3 Mastering a defined set of pilot competencies should enable a pilot to perform their routine duties and manage unforeseen situations which cannot be trained in advance.

2.1.5.1.4 Similarly, mastering a set of instructor and evaluator competencies (IECs) should enable an instructor/evaluator (IE) to perform instruction and evaluation duties and manage the full spectrum ranging from ground instruction to evaluations in dynamic flight situations. It is beneficial to define a set of universal competencies, which can be consistently applied throughout the whole career of an IE.

2.1.5.1.5 The competencies for instructors and evaluators developed hereby are based on the latest ICAO provisions, EASA and FAA regulations, guidance material and best practices from the industry.

2.1.5.1.6 In the competency framework, the evaluator is a person authorized to conduct the formal and final summative assessment of a trainee's performance.

2.1.5.1.7 The table below proposes an overview of the Pilot Instructor and Evaluator Competency (IEC) Framework. Therefore, operators and ATOs electing to implement competency-based training and assessment for their instructors and evaluators may develop an adapted competency model to suit the particular context of their organization

2.1.5.1.8 In the tables below, the cells in green are not part of the competency framework but are to be developed by the operator or the ATO for the adapted competency model, respecting the guidance contained in the green cells.

2.1.5.2 pilot instructor and evaluator competency framework

The tables in 2.1.5.3 provide the details for each competency.

Competencies for pilot instructors and evaluators				
Name of the competency	Description	Performance Criteria		
		Observable behaviour (OB)	Competency Assessment	
			Final competency standard	Conditions
Pilot competencies[1]	See Aeroplane Pilot Competency Framework[2]	See the observable behaviours in the tables below	Operators and ATOs define in their relevant approved manuals the level of performance to be achieved by the instructor and evaluator.	**Ground training** and/or **Flight training**
Management of the learning environment	See descriptions in the tables below for the individual competencies			
Instruction				
Interaction				
Assessment and evaluation				

1. For ground instructors some pilot competencies may not apply – see 1.3.1.
2. Only an Aeroplane Pilot Competency Framework is published. For other categories of aircraft, suitable amendments to the framework may be necessary to account for differences in piloting.

2.1.5.3 Tables detailing the individual competencies for instructors and evaluators (IEC1 – IEC5)

Note. The competencies and observable behaviours in the tables are not listed according to any pre-defined priority. Observable behaviours may include, but are not limited to, the observable behaviours listed in the tables below.

2.1.5.3.1 IEC1 – Pilot competencies

Instructor and evaluator competency – pilot competencies				
Name of the competency	Description	Performance Criteria		
		Observable behaviour (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC1: **Pilot competencies**[1]	See Aeroplane Pilot Competency Framework[2]	See Aeroplane Pilot Competency Framework[2]	Operators and ATOs define in their relevant approved manuals the level of performance to be achieved by the instructor and evaluator.	**Ground training** and/or **Flight training**

1. For ground instructors some pilot competencies may not apply: the operators and ATOs have to identify which pilot competencies and associated observable behaviours are applicable depending on their ground instructors/evaluators activities. As an example, the pilot competency communication must be demonstrated by ground instructors/evaluators (except for some observable behaviours) while the pilot competency flight path management manual control may not be mandatory.
2. Only an Aeroplane Pilot Competency Framework is published. For other categories of aircraft, suitable amendments to the framework may be necessary to account for differences in piloting.

2.1.5.3.2 IEC2 – Management of the environment

Instructor and evaluator competency – management of the learning environment				
Name of the competency	Description	Performance Criteria		
		Observable behaviour (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC2: **Management of the learning environment**	Ensures that the instruction, assessment and evaluation are conducted in a suitable and safe environment	OB 2.1 Applies TEM in the context of instruction/ evaluation OB 2.2 Briefs on safety procedures for situations that are likely to develop during instruction/evaluation OB 2.3 Intervenes appropriately at the correct time and level (e.g. progresses from verbal assistance to taking over control) OB 2.4 Resumes training/evaluation as practicable after any intervention OB 2.5 Plans and prepares training media, equipment and resources OB 2.6 Briefs training devices or aircraft limitations that may influence training, when applicable OB 2.7 Creates and manages conditions that are suitable for the training objectives (e.g. FSTD, airspace, ATC, weather, time, etc.) OB 2.8 Adapts to changes in the environment while minimizing training disruptions OB 2.9 Manages time, training media and equipment to ensure that training objectives are met	Operators and ATOs define in their relevant approved manuals the level of performance to be achieved by the instructor and evaluator.	**Ground training** and/or **Flight training**

2.1.5.3.3 IEC3 – Instruction

Instructor and evaluator competency – instruction				
Name of the competency	Description	Performance Criteria		
		Observable behaviour (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC3: **Instruction**	Conducts training to develop the trainee´s competencies	OB 3.1 References approved sources (operations and technical sources, training manuals and regulations) OB 3.2 States clearly the objectives and clarifies roles for the training OB 3.3 Follows the approved training programme OB 3.4 Applies instructional methods as appropriate, (e.g. explanation, demonstration, learning by discovery, facilitation, in-seat instruction) OB 3.5 Sustains operational relevance and realism OB 3.6 Adapts the amount of instructor inputs to ensure that the training objectives are met OB 3.7 Adapts to situations that might disrupt a planned sequence of events OB 3.8 Continuously assesses trainee's competencies OB 3.9 Encourages the trainee to self- assess OB 3.10 Allows trainee to self-correct in a timely manner OB 3.11 Applies trainee-centred feedback techniques (e.g. facilitation, ...) OB 3.12 Provides positive reinforcement	Operators and ATOs define in their relevant approved manuals the level of performance to be achieved by the instructor and evaluator.	**Ground training** and/or **Flight training**

2.1.5.3.4 IEC4 – Interaction

Instructor and evaluator competency – interaction				
Name of the competency	Description	Performance Criteria		
		Observable behaviour (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC4: **Interaction**	Supports the trainee's learning and development Demonstrates exemplary behaviour (role model)	OB 4.1 Shows respect for the trainee, e.g. for culture, language and experience OB 4.2 Shows patience and empathy, e.g. by actively listening, reading non-verbal messages and encouraging dialogue OB 4.3 Manages trainee´s barriers to learning OB 4.4 Encourages engagement and mutual support OB 4.5 Coaches the trainees OB 4.6 Supports the goal and training policies of the Operator/ATO and Authority OB 4.7 Shows integrity (e.g. honesty and professional principles) OB 4.8 Demonstrates acceptable personal conduct, acceptable social practices, content expertise, a model for professional and interpersonal behaviour OB 4.9 Actively seeks and accepts feedback to improve own performance	Operators and ATOs define in their relevant approved manuals the level of performance to be achieved by the instructor and evaluator.	**Ground training** and/or **Flight training**

2.1.5.3.5 IEC5 – Assessment and evaluation

Instructor and evaluator competency – assessment and evaluation				
Name of the competency	Description	Performance Criteria		
		Observable behaviour (OB)	Competency Assessment	
			Final competency standard	Conditions
IEC5: Assessment and evaluation	Assesses the competencies of the trainee Contributes to continuous training system improvement.	OB 5.1 Complies with Operator / ATOs and authority requirements OB 5.2 Ensures that the trainee understands the assessment process OB 5.3 Applies the competency standards and conditions OB 5.4 Assesses trainee's competencies OB 5.5 Performs grading OB 5.6 Provides recommendations based on the outcome of the assessment OB 5.7 Makes decisions based on the outcome of the summative assessment OB 5.8 Provides clear feedback to the trainees OB 5.9 Reports strengths and weaknesses of the training system (training environment, curriculum, assessment/evaluation) including feedback from trainees OB 5.10 Suggests improvements for the training system OB 5.11 Produces reports using provided appropriate forms and media	Operators and ATOs define in their relevant approved manuals the level of performance to be achieved by the instructor and evaluator.	**Ground training** and/or **Flight training**

2.1.5.4 Instructor Competencies and Assessment

Instructor Competencies and Assessment

(a) Training should be both theoretical and practical. Practical elements should include the development of specific instructor skills, particularly in the area of teaching and assessing threat and error management and CRM.

(b) The training and assessment of instructors should be made against the following performance standards:

Competence	Performance	Knowledge
Prepare resources	(a) ensures adequate facilities; (b) prepares briefing material; (c) manages available tools; (d) plans training within the training envelope of the training platform, as determined by the ATO (Note: See GM1 ORA.ATO.125 point (f)).	(a) understand objectives; (b) available tools; (c) competency-based training methods; (d) understands the training envelope of the training platform, as determined by the ATO (Note: See GM1 ORA.ATO.125 point (f)) and avoids training beyond the boundaries of this envelope.
Create a climate conducive to learning	(a) establishes credentials, role models appropriate behaviour; (b) clarifies roles; (c) states objectives; (d) ascertains and supports student pilot's needs.	(a) barriers to learning; (b) learning styles.
Present knowledge	(a) communicates clearly; (b) creates and sustains realism; (c) looks for training opportunities.	teaching methods
Integrate TEM and CRM	(a) makes TEM and CRM links with technical training; (b) for aeroplanes: makes upset prevention links with technical training.	(a) TEM and CRM; (b) Causes and countermeasures against undesired aircraft states
Manage time to achieve training objectives	Allocates the appropriate time to achieve competency objective.	syllabus time allocation
Facilitate learning	(a) encourages trainee participation; (b) shows motivating, patient, confident and assertive manner; (c) conducts one-to-one coaching; (d) encourages mutual support.	(a) facilitation; (b) how to give constructive feedback; (c) how to encourage trainees to ask questions and seek advice.
Assesses trainee performance	(a) assesses and encourages trainee self-assessment of performance against competency standards; (b) makes assessment decision and provides clear feedback; (c) observes CRM behaviour.	(a) observation techniques; (b) methods for recording observations.
Monitor and review progress	(a) compares individual outcomes to defined objectives; (b) identifies individual differences in learning rates; (c) applies appropriate corrective action.	(a) learning styles; (b) strategies for training adaptation to meet individual needs.

Competence	Performance	Knowledge
Evaluate training sessions	(a) elicits feedback from student pilots; (b) tracks training session processes against competence criteria; (c) keeps appropriate records.	(a) competency unit and associated elements; (b) performance criteria.
Report outcome	Reports accurately using only observed actions and events.	(a) phase training objectives; (b) individual versus systemic weaknesses.

2.1.5.5 Instructor Competency Framework

Units and Competency Elements	Performance Criteria
1. Unit 1-Preparation of Training Facility	**The competent instructor must ensure that the training environment is conducive to effective learning. The training environment includes facilities, equipment and instructional materials.**
1.1 Ensures facilities and equipment are adequate for the course.	a) Ensures that the facilities are reserved and are adequate to comply with the objectives of the course. b) Ensures that the available physical space is adequate for learning. c) Ensures that the environment and the existing conditions are adequate for the objectives of the course. d) Ensures the equipment is adequate and ready for use.
2. Unit 2-Management of Trainees	**The competent instructor must ensure that the training is adapted to the trainees and their needs.**
2.1 Understands the trainees	a) Identifies and shows knowledge of the trainees' characteristics (experience, language, culture). b) Talks about the training needs. c) Shows knowledge of the different learning styles. d) When authorized, adapts the training methods and materials to the needs of the trainees.
2.2 Trains the trainees	a) Shows knowledge of any indicators that measure the readiness of the trainees for the course (as possible). b) Is flexible and provides support to the development and needs of the trainees. c) Generates a relationship of cooperation with the trainees. d) Creates and maintains motivation between the trainees and the topic of the course.
2.3 Uses an effective training strategy	a) Quickly evaluates the average level of the group and reviews the training strategies. b) Encourages participation in-group discussions. c) Poses questions to the entire group. d) Poses individual questions. e) Poses questions of a variety of knowledge levels.
3. Unit 3-Delivery of the Course	**The competent instructor must provide variety in the training methods as required by the trainees.**
3.1 Establishes and maintains credibility	a) Displays exemplary role of model behavior (meaning, the expected behaviour in the technical role of the course in accordance to competencies and the corresponding Skills, Knowledge and Attitudes (S/K/A)). b) Shows respect for specific organizational characteristics (procedures, dress code, personal image, acceptable personal behavior, etc.). c) Complies with the established legal and ethical standards. d) Establishes and maintains an environment of respect.

Units and Competency Elements	Performance Criteria
3.2 Shows affective presentation skills	a) Stimulates and sustains the interest of the trainees. b) Maintains the sequence of training materials in the appropriate way. c) Uses voice effectively. d) Uses eye contact effectively. e) Uses gestures, silences and body language effectively. f) Uses work aids effectively. g) Shows effective questioning skills. h) Provides effective feedback, answers questions from the participants, and improves the delivery by incorporating relevant experience and / or examples. i) Presents an effective introduction, states the objective(s) presents a plan, provides a clear explanation of the different steps, and presents an effective summary.
3.3 Provides an effective training delivery	a) Communicates effectively both verbally and non-verbally. b) Listens actively and reads nonverbal messages correctly. c) Asks appropriate questions to promote learning or to confirm understanding. d) Provides opportunities for trainees to ask questions, treats wrong answers in a positive way. e) Uses a variety of questions (expository, inductive, rhetorical, troubleshooting), employs various interrogation techniques, manages course participation. f) Maintains trainee discussions within the topics of the course by starting them, concluding them, monitoring and controlling them. g) Answers questions clear and adequately. h) Generates content by questioning, redirecting, balancing participation, etc. i) Maintains debates focused on key topics. j) Provides instruction regularly confirming the understanding by paraphrasing, summarizing, etc., links training activities, summarizes key points and activities related to the course objectives. k) Uses appropriate communication skills (listens, does not interrupt the other party, clarity in the interventions prevents conflicts from arising). l) Establishes clear goals and clarifies the roles in the training or evaluation performed.
3.4 Creates and maintains realism	a) Ensures realism in the script options provided and shared examples. b) Links the content with case studies and professional experience. c) Provides clarification and feedback.
3.5 Manages time	a) Assigns activities the appropriate time. b) Adjusts the allotted time for activities to ensure accomplishing the objectives. c) Implements contingency plans for situations in which the activities should be eliminated, reduced or replaced.
4. Unit 4 – Perform Trainee Evaluation	**The competent instructor must appropriately, objectively and correctly evaluate the trainees.**
4.1 Uses the evaluation methods	a) Selects the events and activities with which he/she will evaluate the performance of the trainees. b) Clarifies the regulations of the evaluation procedure to the trainees. c) Communicates to the trainees the criteria that will be implemented during the performance evaluation.

Units and Competency Elements	Performance Criteria
4.2 Monitors the performance of trainees during the class sessions	a) Observes behaviours b) Interprets the observed behaviours and comments on them adequately. c) Allows trainees to correct themselves at the opportune moment. d) Identifies individual differences in learning styles and adjusts the course strategy whenever possible.
4.3 Makes objective evaluations	a) Compares performance results of the trainees with the established objectives. b) Applies performance standards fairly and consistently. c) Observes and encourages self-performance evaluation with regard to the established performance standard. d) Makes decisions based on task results.
4.4 Provides feedback that is both understandable and usable	a) Ensures that trainees understand the entire feedback and assessment. b) Applies adequate corrective measures. c) Uses facilitation techniques when deemed appropriate in each different case. d) Provides positive reinforcement. e) Encourages mutual support. f) Creates and proposes how to reach an agreement about plans for improvement or rehabilitation.
5. Unit 5-Perform Course Evaluation	**The competent instructor must evaluate the effectiveness of the training system.**
5.1 Evaluates the effectiveness of the course or course stage	a) Evaluates the feedback of the trainees in the training process. b) Evaluates the trainees' mastery of the end of course objectives. c) Evaluates the effect that the facilities have on the performance of the trainees. d) Evaluates the effect of the equipment on the performance of the trainees. e) Evaluates the effect of the training materials on the performance of the trainees. f) Evaluates the effect of the program schedule on the performance of the trainees.
5.2 Present information about course evaluation	a) Identifies strengths and weaknesses of the training course. b) Identifies the barriers for knowledge transfer and learning. c) Makes recommendations for the improvement of the course design, content, exercises, etc. d) Makes recommendations for the improvement of the course documentation. e) Makes recommendations for the improvement of tools and training facilities. f) Shares information with other instructors and directors.
6. Unit 6 – Ongoing performance improvement	**The competent instructor must show a positive and proactive attitude to improve his/her performance.**
6.1 Self-evaluates the effectiveness of his/her role as instructor.	a) Evaluates his/her communicative skills. b) Evaluates his/her skills as presenter. c) Evaluates his/her skills as facilitator. d) Evaluates his/her skills in the use of training tools. e) Evaluates his/her skills for using training materials. f) Evaluates his/her skills as trainee's evaluator. g) Evaluates his/her performance as instructor and learns from the results.
6.2 Evaluates the effectiveness	a) Encourages and accepts feedback about performance as instructor. b) Actively seeks for feedback about the course from trainees and colleagues.

Units and Competency Elements	Performance Criteria
6.3 Maintains personal development	a) Maintains the required qualifications. b) Makes an effort to increase and maintain knowledge and skills up to date. c) Displays ongoing improvements of competencies as instructor.

2.1.6 Competency-Based Training and Assessment for Remote Pilot Licence (RPL)

2.1.6.1 INTRODUCTION

2.1.6.1.1 This chapter outlines the principles and procedures that are applicable to the development and implementation of a remote pilot competency-based training and assessment programme and that shall be followed using the methodology outlined in Chapter 2. The appendix to this chapter contains the RPL Competency framework.

2.1.6.1.2 The approved training organizations (ATO) conducting approved RPL training and the Licensing Authorities shall comply with the procedures in this chapter.

2.1.6.1.3 The RPL competency framework in the appendix to this chapter shall be used as the basis for the development of an adapted competency model and approval of competency-based training and assessment programmes specific to the remotely piloted aircraft system (RPAS) operational context.

2.1.6.2 ASSESSMENT

2.1.6.2.1 The assessment process developed by the ATO, which includes the assessment (evidence) guide, conditions and competency standards required for assessing applicants, shall be approved by the Licensing Authority.

2.1.6.2.2 The RPL applicant shall successfully complete the approved competency-based training and assessment programme.

2.1.6.3 TRAINING

2.1.6.3.1 All competency-based training and assessment for RPLs shall be developed using analyse, design, develop, implement and evaluate (ADDIE) principles.

2.1.6.3.2 The competency-based training and assessment programme for RPL shall consist of an integrated programme of theoretical and practical instruction.

2.1.6.4 RPAS INSTRUCTOR AND RPL EXAMINER QUALIFICATIONS

2.1.6.4.1 RPAS instructors and RPL examiners shall meet the following requirements:

(a) demonstrate competencies described in the appendix to this chapter; and

(b) hold the qualifications to provide instruction for RPL training.

2.1.6.4.2 All RPL examiners shall receive refresher training and be authorized or re-authorized using a documented process acceptable to the Licensing Authority implemented by an ATO at intervals established by the Licensing Authority.

2.1.6.5 COMPETENCY FRAMEWORK FOR RPL

Note 1.— Paragraph **1.2.5 STRUCTURE OF ADAPTED COMPETENCY MODELS** *states that this framework should be adapted to the RPAS operational context. It does not address the specific definition of duties, sharing of tasks, ratings and proficiency levels existing in the RPAS operator organization. The competencies in the table are not listed according to a pre-defined priority.*

Note 2.— The principles of threat and error management should be integrated in the development of competency based training and assessment programmes.

Competency	*Competency description*	*Observable behaviour*
Situational awareness	Perceives and comprehends the operational situation of the moment and all of the relevant information available and anticipates what could happen that may affect the operation	– Identifies and assesses accurately the state of the RPAS – Identifies and assesses accurately the RPA's vertical and lateral position, and its anticipated flight path – Identifies and assesses accurately the general environment as it may affect the flight, including the air traffic neighbouring the RPA operation and the meteorological conditions that could impact the operation – Conducts the operation in accordance with the airspace configuration where the RPAS operation is taking place – Keeps track of time and energy – Maintains awareness of the people involved in or affected by the operation and their capacity to perform as expected – Anticipates accurately what could happen, plans and stays ahead of the situation – Develops effective contingency plans based upon potential threats – Recognizes and effectively responds to indications of reduced situational awareness

Competency	*Competency description*	*Observable behaviour*
Application of procedures	Identifies and applies procedures in accordance with published operating instructions and applicable regulations, using the appropriate knowledge	– Identifies the source of operating instructions – Follows standard operating procedures (SOPs) unless a higher degree of safety dictates an appropriate deviation – Identifies and follows all operating instructions in a timely manner – Correctly operates the RPAS and associated equipment – Complies with applicable regulations – Applies relevant procedural knowledge
Communication	Demonstrates effective verbal, written and nonverbal communications, in normal and abnormal situations	– Ensures the recipient is ready and able to receive the information – Selects appropriately what, when, how and with whom to communicate – Conveys messages clearly, accurately and concisely – Confirms that the recipient correctly understands important information – Listens actively and demonstrates understanding when receiving information – Asks relevant and effective questions – Adheres to standard radiotelephony phraseology and procedures – Accurately reads and interprets required documentation for the operation of RPAS – Accurately reads, interprets, constructs and responds to datalink messages – Completes accurate reports as required by operating procedures – Correctly interprets non-verbal communication

Competency	*Competency description*	*Observable behaviour*
RPA flight path management, automation	Controls the RPA flight path through automation, including appropriate use of flight management system(s) and guidance	– Where applicable, uses eye contact, body movement and gestures that are consistent with and support verbal messages – Controls the RPA through automation with accuracy and smoothness as appropriate to the situation – Contains the RPA within the normal flight envelope – Maintains the desired flight path during flight using automation – Takes appropriate action in case of deviations from the desired RPA trajectory – Selects appropriate level and mode of automation in a timely manner considering phase of flight and workload – Effectively monitors automation, including engagement and automatic mode transitions – Controls the RPA safely in degraded automation using only the relationship between RPA attitude, speed and thrust if applicable

Competency	*Competency description*	*Observable behaviour*
Leadership, teamwork and self-management	Demonstrates effective leadership, team working and self-management	– Understands and agrees with the crew's roles and objectives – Creates an atmosphere of open communication and encourages team participation – Uses initiative and gives directions when required – Admits mistakes and takes responsibility for own performance, detecting and resolving own errors – Anticipates and responds appropriately to other crew members' needs – Carries out instructions when directed – Communicates relevant concerns and intentions – Gives and receives feedback constructively – Confidently intervenes when important for safety – Demonstrates empathy and shows respect and tolerance for other people – Engages others in planning and allocates activities fairly and appropriately according to abilities – Addresses and resolves conflicts and disagreements in a constructive manner – Demonstrates self-control in all situations – Self-evaluates the effectiveness of actions

Competency	*Competency description*	*Observable behaviour*
Problem solving and decision making	Accurately identifies risks and resolves problems. Uses the appropriate decision-making processes	– Seeks accurate and adequate information from appropriate sources – Identifies and verifies what and why things have gone wrong – Employs proper problem solving strategies – Perseveres in working through problems without reducing safety – Uses appropriate and timely decision-making processes – Identifies and considers options effectively – Monitors, reviews and adapts decisions as required – Identifies and manages risks and threats to the safety of the RPAS and people effectively – Changes behaviour and responds as needed to deal with the demands of the changing situation
Workload management	Manages available resources efficiently to prioritize and perform tasks in a timely manner under all circumstances	– Plans, prioritizes and schedules tasks effectively – Manages time efficiently when carrying out tasks – Offers and accepts assistance, delegates when necessary and asks for help early – Reviews, monitors and crosschecks actions conscientiously – Verifies that tasks are completed to the expected outcome – Manages and recovers from interruptions, distractions, variations and failures effectively

Competency	*Competency description*	*Observable behaviour*
Coordination and handover	Manages coordination and handover between personnel in operational positions and with other affected personnel	– Coordinates with personnel and other stakeholders, in a timely manner – Selects coordination/handover method based on circumstances, including urgency of coordination, status of facilities and prescribed procedures – Coordinates the handover using the prescribed coordination procedures – Coordinates changes of status of operational facilities such as equipment, systems and functions – Coordinates changes of status of airspace and aerodrome resources, as applicable – Uses clear and concise terminology for verbal coordination – Uses standard message formats and protocols for non-verbal coordination – Uses clear and concise non-standard coordination methods when required – Conducts effective briefings during position handover

Competency	*Competency description*	*Observable behaviour*
Management of abnormal situations	Detects and responds to emergency and abnormal situations related to RPAS operations and manages the degraded modes of operation of the RPAS	– Identifies the possibility for the development of an emergency or abnormal situation from the information available – Determines the nature of the abnormal situation emergency – Prioritizes actions based on the urgency of the situation – Decides the most appropriate actions to initiate – Follows the prescribed procedures for managing the RPAS in emergency situations – Detects potential degradation to RPAS and/or equipment with particular attention to the potential loss of the C2 Link – Assesses the impact of the degraded mode of operation – Takes actions, when required, to ensure the safety of the people overflown – Creates solutions when no guidance or procedure for a given abnormal situation

2.1.7 Other Flight Crew Members [Reserved]

2.1.8 Flight Validation Pilots [Reserved]

2.2 Cabin Crew [Reserved]

2.3 Flight Operations Officer/Flight Dispatchers

GENERAL PROVISIONS FOR COMPETENCY-BASED TRAINING AND ASSESSMENT FOR FLIGHT OPERATIONS OFFICERS/FLIGHT DISPATCHERS (FOOs)

2.3.1 This chapter provides the procedures for establishing a competency-based training and assessment programme for FOOs, with which approved training organizations (ATOs), airlines and Authorities shall comply when implementing such programmes. These procedures are complementary to those provided in Part I, Chapter 2 of the PANS-TRG. (ICAO DOC 9868)

2.3.2 The basic qualification for all functions or tasks in the system of operational control is the FOO Qualification. All functions (independent from the job title) and with the responsibility and authority for initiation, planning, continuation and diversion of each flight shall be qualified according to these requirements.

2.3.3 Following the generic FOO qualification, additional competencies (knowledge, skills and attitude) might be required according to the intended specific function within the operator. Operator specific functions or tasks may include, for example:

— Flight Dispatch (Flight Planning)

— Operations Control

— Flight Control (Inflight Control or Mission Support)

— Operations Engineering

2.3.4 Competency framework for FOOs provided in 2.3.8 to this chapter shall be used as the basis for the development of an adapted competency model. The adapted competency model and associated competency-based training and assessment programme shall be approved by the appropriate authority.

2.3.5 Training

A competency-based training and assessment programme for FOOs shall include on-the-job training to ensure that competency standards appropriate to the exercise of duty are consistently achieved.

Note: Detailed guidance on how to structure competency-based training and assessment for FOOs in different phases of training can be found in the Manual on Flight Operations Officers/Flight Dispatchers Competency-based Training and Assessment (Doc 10106).

2.3.6 Assessment

2.3.6.1 FOOs shall meet the final competency standards acceptable to the appropriate Authority and in compliance with Annex 1— *Personnel Licensing* requirements.

2.3.6.2 Assessment shall include a component of on-the-job competency assessment.

2.3.7 Evaluation of Training Programmes

2.3.7.1 The competency-based training and assessment programme for FOOs shall include an ongoing evaluation of the training programme acceptable to the authority. The evaluation shall ensure that:

(a) the training and assessment plans are relevant to the work of FOOs in the specific context and environment to which they may be assigned after training;

(b) the programme enables the trainees to achieve the interim and final competency standards; and

(c) remediation actions are taken if in-training and post-training evaluation indicates a need to do so.

2.3.8 Competency Framework for Flight Operations Officer/Flight Dispatcher (FOO)

2.3.8.1. Competency framework for FOOs provides the basis that ATOs shall use to develop an adapted competency model suitable for their operating environment.

2.3.8.2. ATOs shall use the training specifications and the adapted competency model to develop their training and assessment programmes.

2.3.8.3. Competency framework for FOOs is generic and applicable to all the job functions (flight dispatcher, operations controller, etc.). Consequently, the framework does not address the specific definition of duties, sharing of tasks, and proficiency levels existing in the organization.

2.3.8.4. The framework is independent of the operating conditions, including the type of equipment in use or of the major areas of application.

Note 1. — The competencies and observable behaviours in the table below are not listed according to any pre-defined priority. Observable behaviours may include, but are not limited to, the observable behaviours listed in the table below.

Note 2. — The principles of risk management should be integrated in the development of competency-based training programmes.

Competency	*Description*	*Observable behaviours (OB)*
Application of procedures and regulations	Identifies and applies procedures in accordance with published operating instructions and applicable regulations.	OB 1.1 Interprets SOPs appropriately
		OB 1.2 Applies SOPs flexibly where necessary
		OB 1.3 Follows all procedures in a timely manner
		OB 1.4 Complies with applicable regulations and procedures
Technical expertise	Applies and improves individual technical knowledge and skills.	OB 2.1 Retrieves the applicable data and operating procedures
		OB 2.2 Explains to other stakeholders the intent of the applicable procedure for a given context when necessary
		OB 2.3 Uses appropriate operational information (Meteorological, airports, crew, aircraft, network, general) to make optimum decisions
		OB 2.4 Uses standard and non-standard information distribution systems and sources
		OB 2.5 Keeps up to date with changes to operational standards
Process Improvement	Contributes to the continuous improvement of the system.	OB 3.1 Consistently provides appropriate guidance to stakeholders and colleagues on how to implement procedures
		OB 3.2 Analyses evidence to identify opportunities for process improvement
		OB 3.3 Proposes process improvements for approval/adoption by management
		OB 3.4 Provide suitable justification for proposed improvements
		OB 3.5 Recognizes trends in practice of one's own technical area

Competency	*Description*	*Observable behaviours (OB)*
Communication	Communicates effectively in all situations.	OB 4.1 Ensures the recipient is ready and able to receive the information
		OB 4.2 Selects appropriately what, when, how and with whom to communicate
		OB 4.3 Conveys messages clearly, accurately and concisely
		OB 4.4 uses and interprets non-verbal communication appropriately
		OB 4.5 Confirms that the recipient correctly understands important information
		OB 4.6 Listens actively when receiving information
		OB 4.7 Asks relevant and effective questions
		OB 4.8 Adheres to standard radiotelephone phraseology and procedures
		OB 4.9 Accurately interprets communication in the language used in the Operation Manuals and in the operational environment
Situation Awareness	Perceives and comprehends all of the relevant information available and anticipates what could happen that may affect the operation.	OB 5.1 Identifies hazards and assesses risks
		OB 5.2 Adjusts the operation in response to changes in the available the available resources (infrastructure, IT-systems, personnel)
		OB 5.3 Assesses the status of the operation (technical status of aircraft, weather conditions, NOTAMS, industrial action etc.)
		OB 5.4 Monitors current operations to identify operational risk
		OB 5.5 Develops contingency plans sufficiently in advance of an identifiable threat or risk

Competency	*Description*	*Observable behaviours (OB)*
Workload management	Manages available resources efficiently to prioritize and perform tasks in a timely manner under all circumstances.	OB 6.1 Plans, prioritizes and schedules tasks effectively
		OB 6.2 Manages time efficiently when carrying out tasks
		OB 6.3 Maintains self-control in all situations
		OB 6.4 Collaborates to balance workload
		OB 6.5 Delegates tasks when necessary
		OB 6.6 Recognizes overload and asks for help early
		OB 6.7 Monitors and cross-checks actions
		OB 6.8 Verifies that tasks are completed with the expected outcome
		OB 6.9 Manages interruptions, distractions and failures
		OB 6.10 Evaluates individual capacity to perform work and takes appropriate action
Problem-solving and decision-making	Accurately identifies risks and resolves problems. Uses appropriate decision-making techniques.	OB 7.1 Identifies relevant information required for the analysis of operational situations
		OB 7.2 Develops and applies an appropriate model for the situation (relations, coefficients etc.)
		OB 7.3 Makes appropriate decisions when confronted with conflicting, unexpected or incomplete information
		OB 7.4 Adapts decision-making process to available time
		OB 7.5 Evaluates options in view of safety, costs and operational stability
		OB 7.6 Define the deadlines that limit the available options
		OB 7.7 Uses appropriate decision-making processes and tools

Competency	*Description*	*Observable behaviours (OB)*
		OB 7.8 Evaluates own decision-making to improve performance
Leadership and teamwork	Collaborates up, down and across the organization to foster and promote a clear vision and common goals. Energizes others to achieve the operational goals.	OB 8.1 Manages professional relationships with appropriate role boundaries
		OB 8.2 Gains the trust and confidence of others
		OB 8.3 Inspires others to collaborate and strive towards excellence
		OB 8.4 resolves conflicts and disagreements in a constructive manner
		OB 8.5 Takes responsibility for mistakes
		OB 8.6 Provides relevant information and solutions to others
		OB 8.7 Provides and seeks effective and constructive feedback

3. Training and Assessment for Aircraft Maintenance Personnel

In this topic the principles and procedures for the development and implementation of competency-based training and assessment programme for aircraft maintenance personnel

3.1 Competency-Based Training and Assessment for Aircraft Maintenance Personnel

3.1.1 Introduction

The purpose of the PANS-TRG is to support the training and qualification of personnel conducting activities affecting safety and for whom there are detailed SARPs in Annexes or procedures in PANS with requirements for such training and qualification. This part outlines the principles and procedures for the development and implementation of a competency-based training and assessment programme for aircraft maintenance personnel in order to focus training and assessment on how an AMTEM is expected to competently perform on the job. The goal of competency-based training and assessment is to provide a competent workforce for personnel working in aircraft maintenance including those with certification privileges. The Manual on Training of Aircraft Maintenance Personnel (Doc 10098) contains guidance material on the design and development of an aircraft maintenance personnel training programme as well as examples of training objectives based on Appendix 2 to Chapter 1 (ICAO DOC9868) Guidelines for the Implementation of Competency-based Training and Assessment for Aircraft Maintenance Personnel. Implementation of competency-based training and assessment programmes for AMTEM personnel is optional.

3.1.2 Competency-Based Approach to Training and Assessment

3.1.2.1 The development of competency-based training and assessment shall be based on a systematic approach whereby competencies and their performance criteria are defined, training is based on the competencies identified, and assessments are developed to determine whether these competencies have been achieved.

3.1.2.2 Competency-based training and assessment may be implemented by an AMO or an ATO, or a combination of both. If implemented, in addition to 1.2, competency-based training and assessment shall address as a minimum the following:

(a) the conduct of a training needs analysis;

(b) the derivation of training objectives from the training needs analysis and their formulation in an observable and measurable fashion;

(c) the development of a curriculum with a view to achieving an optimal path to the attainment of competencies;

(d) the development of material-dependent training (as opposed to instructor-dependent training);

(e) the development of criterion-referenced, valid, reliable and performance-oriented assessments;

(f) the performance criteria to be considered by the assessor when assessing each competency and the use of an assessment (evidence) guide applicable to all competency-based assessments.

Note. — A definition of Assessment (evidence) guide can be found in 1.1 of the PANS-TRG.

(g) the selection and description of the training for competency-based assessors;

Note. — Guidance on the selection and training of competency–based assessors is contained in the Manual on Training of Aircraft Maintenance Personnel (Doc 10098).

(h) the identification of indicators to be used to evaluate the effectiveness of training on the AMTEM's performance; and

(i) the use of an ongoing evaluation process to ensure the effectiveness of training and its relevance to real-time operations.

3.1.3 Design of Competency–Based Training and Assessment

IN 1.2 of the PANS-TRG contains guidance on the design of competency-based training and assessment. Licensing Authorities responsible for approving training programmes of AMOs and ATOs should ensure that the training programmes meet the provisions of 1.2

3.1.4 The Competency Framework

3.1.4.1 The competency framework supports the establishment of a systematic approach as mentioned in 1.2 of the PANS-TRG by providing a model that should be adapted to suit the variety of situations that exist worldwide in the aircraft maintenance personnel environment.

3.1.4.2 The competency framework for aircraft maintenance personnel as contained in 3.1.9 consists of a select group of competencies with their associated description and observable behaviours. Organizations electing to implement competency-based training and assessment for aircraft maintenance personnel shall use this the competency framework to develop an adapted competency model that forms the basis for development of competency-based training and assessment for aircraft maintenance personnel. The assessment (evidence) guide is to be developed by AMOs and/or ATOs as part of the local adaptation process.

Note. — The elements of an adapted competency model are outlined in 1.2 of the PANS-TRG and include performance criteria for each competency.

3.1.4.3 The competencies with their associated description and observable behaviours shall be used to develop performance criteria

Note. — The definition of performance criteria is provided in 1.1, of the PANS-TRG.

3.1.5 Evaluation of Training Material

3.1.5.1 Competency-based training and assessment programmes for aircraft maintenance personnel shall be based on the competencies contained in the competency framework in 3.1.9, as applicable to the aircraft maintenance domain, and shall be created using the analysis, design, develop, implement and evaluate (ADDIE) instructional systems design (ISD) methodology or equivalent.

3.1.5.2 Each phase of a CBT programme including theoretical and practical training shall integrate the CBT approach as necessary to ensure required level of competency is achieved the training programme shall comply with the principles of CBTA listed in 1.2 Instructors and Assessors shall be qualified and competent in the technical domain for which the certificate of competency shall be issued. When conducted by an AMO, the training shall be performed under the supervision of a suitably qualified and licensed aircraft maintenance technician/engineer/mechanic. When conducted by an ATO, the training shall be performed under the supervision of an instructor qualified and competent in the technical domain for which the certificate of competency shall be issued.

Note.— Guidelines for the implementation of aircraft maintenance personnel competency-based training and assessment can be found in 3.3

3.1.5.3 Training courses for aircraft maintenance personnel shall include continuous formative assessments of the performance of individual students attending the programme. The process of ongoing evaluation shall be acceptable to the Authority. This evaluation shall ensure that:

(a) the training competencies and related assessment are relevant to the task of aircraft maintenance personnel acting in a particular function; and

(b) the training plan is designed to enable the trainees to meet the interim (if defined) and final competency standards.

3.1.5.4 Corrective action shall be taken if in-training or post-training evaluation indicates a need to do so.

3.1.6 Assessment

3.1.6.1 Licensing Authorities, AMOs and ATOs electing to implement competency-based training and assessment may develop an adapted competency model with its associated performance criteria. The model can be adapted from the corresponding competency framework in developing and approving their own training and assessment programmes for the licensing and/or authorization of aircraft maintenance personnel.

3.1.6.2 Design of competency-based training and assessment of *1.2*, provides a step-by-step guide for licensing authorities. AMOs and ATOs intending to establish competency-based training and assessment that is specific to their environment and requirements shall ensure compliance with *Part I, Chapter 2*, Attachment C (ICAO DOC 9868).

3.1.6.3 Aircraft maintenance personnel shall meet the final competency standards approved by the appropriate authority and in compliance with Annex 1 — *Personnel Licensing* requirements.

3.1.7 Training and Assessment Material

In item 1.2 of the PANS-TRG contains guidance on the development of training and assessment materials. Licensing Authorities responsible for approving training programmes of AMOs and ATOs should ensure that the training and assessment materials meet the provisions of this chapter.

3.1.8 Evaluation of Trainees

3.1.8.1 The competency-based training and assessment for aircraft maintenance personnel shall include formative and/or summative assessment to evaluate the effectiveness of the training and of the performance of individual students attending the training. The evaluation process shall be acceptable to the Authority. This evaluation shall ensure that:

(a) the training and related assessment plans are relevant to the task of aircraft maintenance personnel acting in a particular function;

(b) the trainees meet the interim (if defined) and final competency standards; and

(c) It achieves the training objectives as derived from the training needs analysis.

3.1.8.2 Corrective action shall be taken if in-training or post-training evaluation indicates a need to do so.

Note. — Attachment C to Part I, Chapter 2 in (ICAO DOC9868) illustrates the process that should be considered for evaluating a competency-based training and assessment course.

3.1.9 The Competency Framework for Amtems

3.1.9.1. Introduction

3.1.9.1.1 This part provides a competency framework for aircraft maintenance personnel, which is designed to be used by ATOs and AMOs in developing adapted competency models to suit their organizational context; adapted competency models are then used by ATOs and AMOs to develop competency-based training and assessment plans.

3.1.9.1.2 The competency framework for aircraft maintenance personnel is generic in nature and applicable to broad rating categories. The framework is independent of the type of equipment in use or maintenance activity performed.

3.1.9.1.3 The competency frameworks were developed with the following assumptions:

— they are targeted to aircraft maintenance technicians/ engineers/ mechanics and/ or aircraft component maintenance, aircraft maintenance mechanics/technicians/engineers working within the scope of aircraft, engines and instruction for continued airworthiness found in a variety of manuals and other maintenance instructions which describe how these tasks are executed and to which standards;

— they are applicable in aircraft line, base and workshop maintenance; and— they apply to all aircraft and components thereof.

Note. — The competencies and observable behaviours in the table below are not listed according to any pre-defined priority. Observable behaviours may include, but are not limited to, the observable behaviours listed in the table below.

THE COMPETENCY FRAMEWORK FOR AMTEMs

Competency	*Description*	*Observable behaviours (OB)*	
Competency 1 *APPLICATION OF PROCEDURES*	Description 1 Identifies and applies procedures in accordance with appropriate documents and applicable regulations, using the appropriate knowledge	OB 1.1	Identifies correct processes and procedures associated with a specific task
		OB 1.2	Demonstrates proper use of documents.
		OB 1.3	Applies system knowledge appropriately
		OB 1.4	Demonstrates compliance with applicable regulations
		OB 1.5	Documents work performed or accomplished correctly
Competency 2 *WORK MANAGEMENT*	Description 2 Manages available resources efficiently to prioritize and perform tasks in a safe and efficient manner	OB 2.1	Plans prioritizes and schedules tasks effectively
		OB 2.2	Identifies where and when assistance is needed
		OB 2.3	Requests assistance when and where required
		OB 2.4	Manages time effectively
		OB 2.5	Selects appropriate tools, equipment and resources to support the efficient achievement of tasks
		OB 2.6	Uses available tools safely, efficiently and effectively
		OB 2.7	Offers and accepts assistance, when necessary and asks for help
		OB 2.8	Inspects work area after completion of task
		OB 2.9	Verifies that tasks are completed to the relevant procedures
		OB 2.10	Manages environmental stress, interruptions, distractions, variations and failures effectively
Competency 3 *SITUATIONAL AWARENESS*	Description 3 Recognize and understands the maintenance environment and relevant information; anticipates future events	OB 3.1	Maintains awareness of the maintenance environment
		OB 3.2	Maintains awareness of hazard situations
		OB 3.3	Recognises the future operational situations
		OB 3.4	Verifies that information is accurate and assumptions are correct
		OB 3.5	Is cognisant of ongoing concurrent activities
		OB 3.6	Assesses situations and reports deviations

Competency	*Description*	*Observable behaviours (OB)*	
Competency 4 *TECHNICAL EXPERTISE*	Description 4 Applies and improves technical knowledge and skills to perform maintenance safely and efficiently	OB 4.1 OB 4.2 OB 4.3 OB 4.4	Applies technical knowledge and skills as appropriate for the task Answers technical questions accurately Keeps up to date on specialized technical knowledge and skills Applies appropriate procedures in accordance with the applicable standards
Competency 5 *SYSTEM THINKING*	Description 5 Understands and determines how the various components of systems management interact and affect the overall system safety performance	OB 5.1 OB 5.2 OB 5.3 OB 5.4 OB 5.5 OB 5.6 OB 5.7 OB 5.8 OB 5.9	Evaluates the inter-relationship between policies, processes and procedures Evaluates the inter-relationship between various systems including quality planning, quality control, and quality assurance of the stakeholder Recognises importance of continuous improvement, reactive and proactive processes Recognizes the essential components of a functional safety management system and their interoperability Recognise whether the stakeholder's management processes are appropriate for the size and scope of the operation Correctly interprets performance data analysis Assesses if the stakeholder safety objectives achieve the desired safety requirements Provides feedback on potential deficiencies of the regulatory framework Understands that root cause(s) of deficiencies results from single-point or systemic failure(s)
Competency 6 *COORDINATION AND HANDOVER*	Description 6 Manages coordination and handover between personnel	OB 6.1 OB 6.2 OB 6.3 OB 6.4 OB 6.5 OB 6.6	Coordinates with personnel and other stakeholders Selects coordination/ handover method based on circumstances, including the urgency of coordination, the status of facilities and the prescribed procedures Report safety-critical information Coordinates handover using the prescribed coordination procedures Coordinates changes to status of equipment, systems and functions Uses clear and concise terminology for verbal coordination and confirms that the message was properly received

Competency	*Description*	*Observable behaviours (OB)*
		OB 6.7 Uses standard message formats and protocols for non-verbal coordination OB 6.8 Conducts effective briefings during position handover including transfer of maintenance tasks
Competency 7 *RISK MANAGEMENT*	Description 7 Demonstrates an effective safety approach to the work environment considering its risk profile and the availability of resources	OB 7.1 Carries out comprehensive risk assessments using appropriate methodologies OB 7.2 Makes decisions based on risk assessment outcome OB 7.3 Identify accurately problem areas or hazards that may negatively impact safety OB 7.4 Recognizes company policies, work practices, or organizational cultures that indicate increased levels of risk OB 7.5 Analyses root causes applicable to their task
Competency 8 *TEAMWORK*	Description 8 Operates safely and efficiently as a team member	OB 8.1 Fosters an atmosphere of open communication OB 8.2 Encourages team participation and cooperation OB 8.3 Uses feedback to improve overall team performance OB 8.4 Provides feedback constructively OB 8.5 Shows respect and tolerance for other people OB 8.6 Carries out duties in support of a team OB 8.7 Uses negotiating and problem-solving techniques to manage unavoidable conflict when encountered OB 8.8 Raises relevant concerns in an appropriate manner OB 8.9 Accepts feedback constructively OB 8.10 Shares experiences with the aim of continuous improvement OB 8.11 Manages interpersonal conflicts to maintain an effective team environment OB 8.12 Anticipates and responds appropriately to the needs of others OB 8.13 Demonstrates integrity and honesty OB 8.14 Demonstrate soundness and good judgement

Competency	*Description*	*Observable behaviours (OB)*	
Competency 9 *PROBLEM-SOLVING AND DECISIONMAKING*	Description 9 Accurately identifies and resolves problems using the appropriate decisionmaking processes	OB 9.1	Determines possible solutions to an identified problem
		OB 9.2	Prioritizes effectively
		OB 9.3	Manages risks effectively
		OB 9.4	Considers rules and operating procedures when determining possible solutions to a problem
		OB 9.5	Implements a chosen solution to a problem
		OB 9.6	Organizes tasks in accordance with determined priorities
		OB 9.7	Applies appropriate mitigation strategies for the identified hazards
		OB 9.8	Works through problems without reducing safety
		OB 9.9	Considers expediency and efficiency in decision-making
Competency 10 *SELF MANAGEMENT AND CONTINUOUS LEARNING*	Description 10 Demonstrates personal attributes that improve performance and maintain an active involvement in selflearning and selfdevelopment	OB 10.1	Manages stress in an appropriate manner
		OB 10.2	Self-evaluates to improve performance
		OB 10.3	Adapts to the demands of a situation as needed
		OB 10.4	Engages in continuous development activities
		OB 10.5	Takes responsibility for own performance; detects and resolves own errors
		OB 10.6	Improves performance through selfevaluation
		OB 10.7	Seeks and uses feedback to improve performance
		OB 10.8	Maintains self-control and performs effectively in adverse situations
		OB 10.9	Maintains awareness of developments in aviation and technological evolution
		OB 10.10	Participates in learning activities
Competency 11 *COMMUNICATION*	Description 11 Communicates effectively in all situations and ensures clear and common understanding	OB 11.1	Selects appropriate method of communication
		OB 11.2	Uses effective verbal communication

Competency	*Description*	*Observable behaviours (OB)*
		OB 11.3 Uses effective written and other nonverbal communication OB 11.4 Maintains situational awareness when selecting method of communication Speaks clearly, accurately and concisely OB 11.5 Uses appropriate vocabulary and expressions for communications with stakeholders OB 11.6 Demonstrates active listening by asking relevant questions and providing feedback OB 11.7 Verifies comprehension of counterparts and corrects as necessary OB 11.8 Uses eye contact, body movements and gestures that are consistent with verbal messages where applicable, OB 11.9 Interprets non-verbal communication accurately

3.2 Competency-Based Training and Assessment as Applicable to Maintenance Licences and Privileges

3.2.1 Introduction

This part provides material on the implementation of a competency-based approach to training and assessment for personnel working in aircraft maintenance, including those with certification privileges. This material is complementary to those provided in 1.2 Furthermore, the material will be useful to Licensing Authorities responsible for approving training programmes at approved maintenance organizations (AMOs) and approved training organizations (ATOs) for maintenance personnel.

3.2.2 Existing Aircraft Maintenance Licences and Training Programmes

3.2.2.1 Aircraft maintenance work covers a wide range of activities. Therefore, aircraft maintenance personnel require a wide range of competencies that depends on:

(a) the type and scope of work they do;

(b) the type and structure of the maintenance organization in which they work; and

(c) the environment in which they work.

3.2.2.2 In most States, maintenance functions have been grouped, and national Licensing Authorities issue aircraft maintenance licences in accordance with these groups. Typically, these licences are issued in accordance with one of the following groups:

(a) licences covering a certain technology range (e.g. airframe, engines, avionics, and aircraft systems); and

(b) defining the kind of tasks: licences covering a certain maintenance environment (e.g., line maintenance, base maintenance, shop maintenance and their special processes);

and within these groups there are additional subsets like:

(a) AMTEM licences with or without particular rating endorsements; and

(b) licences rated to a certain level or complexity of work (e.g., Level 1-2-3/Level A-B-C).

3.2.2.3 Where maintenance personnel are required to hold a licence, training programmes shall follow the licensing requirements. Where maintenance personnel are not required to hold licences, training programmes are required to comply with the minimum requirements of Annex 1 — *Personnel Licensing.*

3.2.3 The Link between Competency-Based Training and Assessment and Privileges

3.2.3.1 Holders of licences and/or authorizations are granted privileges to perform defined maintenance tasks and are accountable for them. Therefore, the competencies required to perform these maintenance tasks should form the basis of training, examinations and assessments.

3.2.3.2 The Licensing Authority or organization (as described in 3.2.4 shall ensure that a candidate for a particular licence and/or authorization demonstrates the required set of competencies in relation to the privileges granted.

3.2.4 Issue of Licences and Authorizations (As Described In 2.4 Part Iii Chapter 2 Icao Doc 9868)

4. Training and Assessment for Air Traffic Management (ATM) Personnel

4.1 General Provisions for Competency-Based Training and Assessment for Air Traffic Management (ATM) Personnel

4.1.1 Introduction

This chapter outlines the requirements to be met in order to implement competency-based training and assessment for air traffic management (ATM) personnel. If implemented, competency-based training and assessment shall comply with the procedures of 1.2 Implementation of such training is, however, optional.

4.1.2 Competency-Based Approach to Training and Assessment

Competency-based training and assessment may be implemented by a training organization or an air navigation services provider (ANSP), or a combination of both. If implemented, competency-based training and assessment shall comply with procedures of 1.2

4.2 Competency-Based Training and Assessment for Air Traffic Controllers (ATCOs)

4.2.1 Introduction

4.2.1.1 This chapter provides the procedures for establishing a competency-based training and assessment programme for ATCOs, with which approved training organizations (ATOs), air navigation services providers and Authorities shall comply when implementing a competency-based training and assessment programme. These procedures are complementary to those provided in 1.2 of the PANS-TRG.

4.2.1.2 The competency framework for air traffic controllers provided in 4.2.5 shall be used as the basis for the development of an adapted competency model. The adapted competency model and associated competency-based training and assessment programme shall be approved by the appropriate authority.

4.2.2 Assessment

4.2.2.1 ATCOs shall meet the final competency standards approved by CAAT and in compliance with Annex 1 — Personnel Licensing requirements.

4.2.3 Evaluation of Training Programmes

4.2.3.1 The competency-based training and assessment programme for ATCOs shall include an ongoing evaluation of the training programme acceptable to the authority. The evaluation shall ensure that:

(c) The training and assessment plans are relevant to the work of air traffic controllers in the specific context and environment to which they may be assigned after training;

(d) The training plan is designed to enable the trainee to meet the interim (if defined) and final competency standards; and

(e) remedial actions are taken if in-training or post-training evaluation indicates a need to do so.

4.2.3.2 A competency-based training and assessment programme for ATCOs shall include on-the-job training to ensure that the competencies appropriate to the exercise of duty are consistently achieved. On-the-job training shall be performed under the supervision of a qualified ATC on-the-job training instructor who has been authorized to provide instruction in the area for which the rating shall be issued and be conducted under the SMS of the ANSP.

4.2.4 Guidelines for the Implementation of Competency-Based Training and Assessment for Air Traffic Controllers (ATCOs)

4.2.4.1. Introduction

4.2.4.1.1 This appendix provides guidance to authorities, approved training organizations (ATOs) and air navigation services providers on the measures to be taken to facilitate the efficient implementation of competency-based training and assessment for air traffic controllers (ATCOs).

4.2.4.1.2 Approved training organizations and air navigation service providers may elect to develop a competency-based training and assessment for some of the phases of training (e.g. initial training, unit training, etc.). Detailed guidance on how to structure competency-based training and assessment for ATCOs in different phases of training can be found in the Manual on Air Traffic Controller Competency-based Training and Assessment (Doc 10056).

4.2.5 The Competency Framework for Air Traffic Controllers

4.2.5.1 The competency framework for air traffic controllers provides the basis that shall be used to develop an adapted competency model suitable for the ANSPs.

4.2.5.2 ATOs or ANSPs shall use the adapted competency model to develop their training programmes.

4.2.5.3 The competency framework for air traffic controllers is generic and applicable to broad rating categories such as area, approach and aerodrome. The framework is

independent of the type of equipment in use or of the major areas of application (en-route, approach, tower, etc.) or of the sharing of tasks on the controller working position.

4.2.5.4 The principles of threat and error management should be integrated in the development of competency-based training and assessment programmes.

Note.— Guidance on threat and error management in air traffic control operations and on the collection of related data is contained in Circular 314, Threat and Error Management (TEM) in Air Traffic Control, and Doc 9910, Normal Operations Safety Survey (NOSS).

THE COMPETENCY FRAMEWORK FOR AIR TRAFFIC CONTROLLERS

Note.— This framework needs to be adapted to the local context of the organization. The competencies and observable behaviours in the table below are not listed according to any pre-defined priority. Observable behaviours may include, but are not limited to, the observable behaviours listed in the table below.

Competency	*Definition*	*Observable behaviours (OB)*
Situational awareness	Comprehend the current operational situation and anticipate future events	OB 1.1 Monitors air traffic in own area of responsibility and nearby airspace OB 1.2 Monitors the meteorological conditions that impact on own area of responsibility and nearby airspace OB 1.3 Monitors the status of the ATC systems and equipment OB 1.4 Monitors the operational circumstances in nearby sectors to anticipate impact on own situation OB 1.5 Scans all available sources of information OB 1.6 Acquires information from available surveillance and flight data systems, meteorological data, electronic data displays and any other means available OB 1.7 Integrates information acquired from monitoring and scanning into the overall picture OB 1.8 Analyses the actual situation based on information acquired from monitoring and scanning OB 1.9 Interprets the situation based on the analysis OB 1.10 Anticipates the future operational situation OB 1.11 Identifies potential threats (e.g. high traffic volumes, mountainous terrain, complex airspace infrastructure, complex ATC procedures, adverse weather, unserviceable navigational equipment, flight crew unfamiliar with airport or procedures) OB 1.12 Verifies that information is accurate and interpretation are correct

Competency	*Definition*	*Observable behaviours (OB)*
		OB 1.13 Uses available tools to monitor, scan, comprehend and anticipate operational situations
Traffic and capacity management	Ensure a safe, orderly and efficient traffic flow and provide essential information on environment and potentially hazardous situations	OB 2.1 Manages traffic using prescribed procedures OB 2.2 Issues clearances and instructions that take into account aircraft performance, terrain obstacles, airspace constraints and weather OB 2.3 Uses a variety of techniques to effectively manage the traffic (e.g. speed control, vectoring, traffic sequencing, assigning climb/descent rate) OB 2.4 Increases safety margins when deemed necessary OB 2.5 Takes action when appropriate to ensure that demand does not exceed sector capacity OB 2.6 Maintains focus despite varying traffic levels OB 2.7 Reacts appropriately to situations that have the potential to become unsafe OB 2.8 Issues clearances and instructions to the flight crew that result in an efficient traffic flow OB 2.9 Issues appropriate clearances and instructions OB 2.10 Issues clearances and instructions in a timely manner OB 2.11 Uses available tools to reduce delays and optimize flight profiles OB 2.12 Issues information on the runway conditions, status of airspace, aerodrome resources and status of facilities in a timely manner OB 2.13 Issues hazard and safety alerts to the flight crews when necessary OB 2.14 Issues traffic proximity information to flight crews in a relevant, accurate and timely manner OB 2.15 Issues weather information to flight crews when necessary
Separation and conflict resolution	Manage potential traffic conflicts and maintain separation	OB 3.1 Detects potential traffic conflicts OB 3.2 Selects the appropriate separation method OB 3.3 Applies appropriate separation and spacing OB 3.4 Issues clearances and instructions that ensure separation is maintained OB 3.5 Issues clearance and instructions that resolve conflicts

Competency	*Definition*	*Observable behaviours (OB)*
		OB 3.6 Resolves conflicts through coordination with adjacent sectors or units OB 3.7 Monitors the execution of separation actions OB 3.8 Adjusts control actions, when necessary, to maintainnseparation OB 3.9 Takes corrective action to restore appropriateseparation as soon as possible when below minima
Communication	Communicate effectively in all operational situations	OB 4.1 Selects communication mode that takes into account the requirements of the situation, including speed, accuracy and level of detail of the communication OB 4.2 Speaks clearly, accurately and concisely OB 4.3 Uses standard radiotelephony phraseology, when prescribed OB 4.4 Adjusts speech techniques to suit the situation OB 4.5 Demonstrates active listening by asking relevant questions and providing feedback OB 4.6 Verifies accuracy of read backs and corrects as necessary OB 4.7 Uses plain language when standardized phraseology does not exist or the situation warrants it OB 4.8 Where applicable, uses eye contact, body movements and gestures that are consistent with verbal messages and the environment OB 4.9 Writes or inputs messages according to protocol or in a clear and concise manner where protocol does not exist OB 4.10 Communicates relevant concerns and intentions OB 4.11 Verifies accuracy of system inputs and corrects as necessary
Coordination	Manage coordination between personnel in operational positions and with other affected stakeholders	OB 5.1 Determines the need for coordination OB 5.2 Coordinates with personnel in other operational positions and other stakeholders, in a timely manner OB 5.3 Selects coordination method based on circumstances, including urgency of coordination, status of facilities and prescribed procedures

Competency	*Definition*	*Observable behaviours (OB)*
		OB 5.4 Coordinates the movement, control, transfer of control and changes of previously coordinated data for flights using the prescribed coordination procedures OB 5.5 Coordinates changes of status of operational facilities such as equipment, systems and functions OB 5.6 Coordinates changes of status of airspace and aerodrome resources OB 5.7 Uses clear and concise terminology for verbal coordination OB 5.8 Uses standard ATS message formats and protocol for non-verbal coordination OB 5.9 Uses clear and concise non-standard coordination methods when required OB 5.10 Conducts effective briefings during position handover
Management of nonroutine situations	*Detect and respond to emergency and unusual situations related to aircraft operations and manage degraded modes of ATS operation*	OB 6.1 Recognizes, from the information available, the possibility of an emergency or unusual situation developing OB 6.2 Verifies the nature of the emergency OB 6.3 Prioritizes actions based on the urgency of the situation OB 6.4 Selects the most appropriate type(s) of assistance that can be given OB 6.5 Follows prescribed procedures for communication and coordination of urgent situations OB 6.6 Provides assistance and takes action, when necessary, to ensure safety of aircraft in area of responsibility OB 6.7 Detects that ATS systems and/or equipment have degraded OB 6.8 Assesses the impact of a degraded mode of operation OB 6.9 Follows prescribed procedures for managing, coordinating and communicating a degraded mode of operation OB 6.10 Creates solutions when no procedure exists for responding to non-routine situations

Competency	*Definition*	*Observable behaviours (OB)*
Problem solving and decision making	Find and implement solutions for identified threats and associated undesired states	OB 7.1 Takes into account the existing rules and operating procedures when determining possible solutions to a problem OB 7.2 Uses appropriate tools to interrogate relevant systems as prescribed to assist in determining possible solutions to a problem OB 7.3 Implements an appropriate solution to a problem OB 7.4 Establishes which situations have the highest priority OB 7.5 Organizes tasks in accordance with an appropriate order of priorities OB 7.6 Applies an appropriate mitigation strategy for the threats identified OB 7.7 Perseveres in working through problems without impacting safety
Self-management	Demonstrate personal attributes that improve performance and maintain an active involvement in self learning and self-development	OB 8.1 Takes responsibility for own performance, detecting and resolving own errors OB 8.2 Improves performance through self-evaluation of the effectiveness of actions OB 8.3 Maintains self-control in adverse situations OB 8.4 Responds as needed to deal with the demands of the changing situation
Workload management	Use available resources to prioritize and perform tasks in an efficient and timely manner	OB 9.1 Manages tasks effectively in response to current and future workload OB 9.2 Manages interruptions and distractions effectively OB 9.3 Determines if and when support is necessary based on workload OB 9.4 Asks for help, when necessary OB 9.5 Delegates tasks when necessary to reduce workload OB 9.6 Accepts assistance, when necessary OB 9.7 Adjusts the pace of work according to workload OB 9.8 Selects appropriate tools, equipment and resources to support the efficient achievement of tasks OB 9.9 Uses the automated capabilities of ATS equipment to improve efficiency

Competency	*Definition*	*Observable behaviours (OB)*
Teamwork	Operate as a team member	OB 10.1 Provides both positive and negative feedback constructively OB 10.2 Accepts both positive and negative feedback objectively OB 10.3 Shows respect and tolerance for other people OB 10.4 Carries out actions and duties in a manner that fosters a team environment OB 10.5 Manages interpersonal conflicts to maintain an effective team environment OB 10.6 Uses negotiating and problem-solving techniques to help resolve unavoidable conflict when encountered OB 10.7 Raises relevant concerns in an appropriate manner OB 10.8 Anticipates and responds appropriately to the needs of others

4.3 Competency-Based Training and Assessment for ATC On-The-Job Training Instructors (OJTIs)

4.3.1 Introduction

4.3.1.1 This chapter provides the procedures for establishing a competency-based training and assessment programme for ATC on-the-job training instructors (OJTIs), with which approved training organizations (ATOs), air navigation services providers and Authorities shall comply when implementing a competency-based training and assessment programme. These procedures are complementary to those provided in 1.2 of the PANS-TRG.

4.3.1.2 The competency framework for ATC OJTIs provided in 4.3.5 shall be used as the basis for the development of an adapted competency model. The adapted competency model and associated competency-based training and assessment programme shall be approved by the appropriate authority.

4.3.2 Assessment

4.3.2.1 To be considered as qualified to conduct on-the-job training in the live operational environment, ATC OJTIs shall meet the requirements of the approved OJTI adapted competency model.

4.3.3 Evaluation of Training Programmes

4.3.3.1 The competency-based training and assessment programme for ATC OJTIs shall include an ongoing evaluation of the training programme acceptable to the authority. The evaluation shall ensure that:

(a) the training and assessment plans are relevant to the work of ATC OJTIs in the specific context and environment within which they will provide training;

(b) the training plan is designed to enable trainee ATC OJTIs to meet the final competency standards agreed with the authority; and

(c) remedial actions are taken if in-training or post-training evaluation indicates a need to do so.

4.3.3.2 A competency-based training and assessment programme for ATC OJTIs shall include sufficient practical training to ensure that required competency appropriate to the exercise of duty is consistently achieved. This practical training should be performed under the supervision of an instructor qualified and competent to train ATC OJTIs. In instances where practical training of ATC OJTI trainees is provided through on-the-job training in live environment, the instructor shall be qualified and competent as an ATC OJTI, and the training shall be conducted under the SMS of the ANSP.

4.3.4 Guidelines for the Implementation of Competency-Based Training and Assessment for ATC On-The-Job Training Instructors (OJTIs)

Approved training organizations and air navigation service providers may elect to develop a competency-based training and assessment for ATC OJTIs or some of the phases of this training (e.g., initial training, unit training, etc.). Detailed guidance on how to structure competency-based training and assessment for ATC OJTIs can be found in the Manual on Air Traffic Controller Competency-based Training and Assessment (Doc 10056).

4.3.5 The Competency Framework for ATC On-The-Job Training Instructors

4.3.5.1 The competency framework for ATC on-the-job training instructors provides the basis that shall be used to develop an adapted competency model suitable for the State, region or a specific ANSP's operating environment.

4.3.5.2 ATOs or ANSPs shall use the adapted competency model to develop their training programmes.

4.3.5.3 The competency framework for ATC OJTIs is generic and applicable to the provision of training for any ATC OJTI irrespective of rating category. The framework is independent

of the type of equipment in use or of the major areas of application (en-route, approach, tower, etc.) or of the sharing of tasks on the controller working position.

4.3.5.4 The principles of threat and error management should be integrated in the development of competency-based training and assessment programmes.

COMPETENCY FRAMEWORK FOR ATC ON-THE-JOB TRAINING INSTRUCTORS (OJTIs)

Note 1.— This framework is intended for air traffic controllers who are providing instruction to trainees in the live operational environment.

Note 2.— This framework has not considered the competencies required for instructing in a simulated air traffic environment; although it is acknowledged that many of the competencies are similar.

Note 3.— This framework does not address the specific definition of duties and proficiency levels existing in the organization.

Note 4.— The competencies and observable behaviours in the table are not listed according to any pre-defined priority. Observable behaviours may include but are not limited to the observable behaviours listed in the table below.

Competency	*Definition*	*Observable behaviours (OB)*
Situational Awareness	Comprehends current operational situation, anticipates future events and the impact of the trainee's performance on the operation	OB 1.1 Maintains own situational awareness while instructing OB 1.2 Monitors impact of trainee' s actions on the traffic situation OB 1.3 Monitors impact of trainee' s actions on adjacent sectors OB 1.4 Monitors the trainee's actions continuously OB 1.5 Monitors the trainee' s behaviour for physical signs of cognitive overload or acute stress
Safety and Efficiency Management	Ensures safety and efficiency of the operation during trainin	OB 2.1 Prioritises safety above teaching the trainee OB 2.2 Takes action to ensure safety is never compromised (e.g. correct errors, take over control) OB 2.3 Intervenes in a timely manner to maintain an orderly flow of traffic, when appropriate, and to ensure that safety is not compromised OB 2.4 Ensures traffic efficiency is maintained, including impact on adjacent sectors

Competency	*Definition*	*Observable behaviours (OB)*
		OB 2.5 Manages own and trainee's workload to ensure safe and efficient operations (e.g. sector splitting, increased spacing, adapting instructional techniques)
Mentoring	Supports trainee integration into the professional environment by mentoring, advising, guiding and creating a positive learning experience	OB 3.1 Develops a rapport with the trainee and provides encouragement and support OB 3.2 Promotes positive working relationships OB 3.3 Encourages a positive approach to learning OB 3.4 Demonstrates empathy and understanding, recognising situations when extra support is required OB 3.5 Encourages trainee to self-reflect to identify strengths and weaknesses and areas for improvement OB 3.6 Encourages trainee to look for positive learning experiences from each training session, even those that did not go well OB 3.7 Encourages trainee to extract maximum training value from any feedback, including negative points OB 3.8 Encourages trainee to ask questions as part of the overall learning experience OB 3.9 Helps trainee to build and maintain confidence through encouragement and motivation OB 3.10 Ensures sufficient repetition of learning activities OB 3.11 Ensures opportunities for increasing complexity
Teaching, Instructing and Coaching	Provides instruction and facilitates learning in the operational environment	OB 4.1 Prepares to deliver tailored training for each training session, briefs the trainee prior to taking over the operational position and ensures the trainee understands what is required of him/her OB 4.2 Sets the goals for the session and explains clearly to the trainee the expected performance standards OB 4.3 Ensures the trainee understands the operational situation prior to assuming control OB 4.4 Maintains appropriate seating position and proximity to the trainee OB 4.5 Uses targeted training techniques to enable learning (e. g. talk aloud problem- solving techniques, demonstration, immediate bad habit correction, trainee involvement, questioning techniques) OB 4.6 Adapts training techniques and style to meet the needs of the trainee

Competency	*Definition*	*Observable behaviours (OB)*
		OB 4.7 Ensures appropriate timing of teaching opportunities OB 4.8 Recognises and responds appropriately to the trainee's behaviour (e.g. stress, under confidence, over-confidence) OB 4.9 Allows the trainee to make decisions appropriate to their level of competence and experience OB 4.10 Confirms understanding of the trainee's intended actions and plans (e.g. using questioning techniques) and, when appropriate, trusts the trainee to try their own plans OB 4.11 Remains calm when taking control from the trainee in circumstances dictating this type of intervention OB 4.12 Provides constructive and balanced feedback in a timely and appropriate manner OB 4.13 Debriefs the trainee after the operational session to review the performance emphasising positive actions, areas to work on and strategies for improvement OB 4.14 Helps trainee to develop strategies to overcome any gaps in competencies
Communication	Communicates effectively with the trainee in verbal, non-verbal and written form	OB 5.1 Listens actively OB 5.2 Encourages constructive discussion about the trainee's performance OB 5.3 Speaks clearly, accurately and in a calm and measured manner OB 5.4 Adjusts speech techniques to suit the operational and/or instructional situation (e.g. conveys a sense of urgency, speaks calmly) OB 5.5 Adapts content of communication to the needs of the trainee (e.g. does not overload with too much information) OB 5.6 Explains complex situations clearly (e.g. traffic situations, application of procedures, management of emergencies) OB 5.7 Explains cognitive strategies clearly (e.g. how to analyse situations, prioritize, select a course of action, distribute attention) OB 5.8 Does not allow explanations or questions to cause a distraction OB 5.9 Delivers difficult messages with tact and sensitivity

Competency	*Definition*	*Observable behaviours (OB)*
		OB 5.10 Writes objective and comprehensive reports on the trainee's performance
Assessment	Evaluates the performance of the trainee for the purposes of enabling learning, monitoring progress and/or determining if competence has been achieved	OB 6.1 Gathers factual evidence of the trainee's performance against the objectives OB 6.2 Gathers factual evidence for all the required competencies OB 6.3 Evaluates the trainee's performance in relation to the competencies and previously set goals and performance standards OB 6.4 Analyses poor performance to determine root causes, when appropriate OB 6.5 Determines remedial actions required to address deficiencies in performance, when appropriate OB 6.6 Determines if the evidence gathered, supports a decision that the trainee is competent OB 6.7 Applies consistent standards when assessing performance
Collaboration	Collaborates with relevant parties to facilitate a robust training experience for the trainee.	OB 7.1 Gathers relevant information in advance for the purpose of tailoring the training approach and to maximise productivity of the training session (e.g. from the training organization, human resources department, previous training reports) OB 7.2 Engages with the trainee, other instructors and the training manager(s) for the purposes of tailoring the training approach OB 7.3 Requests supplementary resources to help the trainee, when required (e.g. learning support specialist, counselling, additional practice on a simulator) OB 7.4 Contributes information on the trainee's progress to the training team
Self-assessment	Improves teaching, instructional and coaching capabilities through selfassessment	OB 8.1 Remains open to feedback OB 8.2 Improves performance based on accurate and balanced feedback OB 8.3 Improves performance through self-evaluation of the effectiveness of actions OB 8.4 Maintains self-control in challenging training situations OB 8.5 Responds as needed to deal with the demands of challenging training situations

Competency	*Definition*	*Observable behaviours (OB)*
Ethics and integrity	Demonstrates openness, respect and fairness towards the trainee and considers the consequences when making a decision or taking action	OB 9.1 Treats the trainee respectfully, fairly and objectively regardless of differences OB 9.2 Answers questions truthfully without embellishment or attempt to cover up a lack of knowledge OB 9.3 Maintains privacy and confidentiality when appropriate OB 9.4 Manages professional relationships with appropriate role boundaries OB 9.5 Acts with integrity OB 9.6 Remains objective and starts each training session without prejudice or bias

4.4 Competency-Based Training and Assessment for Air Traffic Safety Electronics Personnel (ATSEP)

4.4.1 Introduction

4.4.1.1 The procedures for establishing a competency-based training and assessment programme for ATSEP, which is recommended for ATSEP training organizations, ANSPs or authorities.

4.4.1.2 Air traffic safety electronics personnel (ATSEP) is the recognized terminology for personnel proven to be competent in the installation, operation and/or maintenance of a CNS/ATM system.

4.4.1.3 It is the responsibility of the air navigation services provider (ANSP) to define the scope of ATSEP activities. The appropriate authority should approve this definition.

4.4.1.4 The competency framework for air traffic safety electronics personnel provided in 4.4.5 should be used as a basis for the development of an adapted competency model.

4.4.2 Assessment

4.4.2.1 Authorities may choose to validate the training and assessment process for ATSEP, including the adapted competency model required for assessing applicants.

4.4.2.2 In the case of a State validated assessment process for ATSEP, the ATSEP shall meet the final competency standards of the adapted competency model.

4.4.3 Training

4.4.3.1 The competency-based training and assessment programme for ATSEP shall include routine evaluation of the effectiveness of the training programme that is acceptable to the authority or the employing ANSP. The evaluation shall ensure that:

(a) The training and assessment plans are relevant to the work of air traffic safety electronics personnel in the specific context and environment to which they may be assigned after training;

(b) The training plan is designed to enable the trainees to meet the interim (if defined) and final competency standards; and

(c) remediation actions are taken if in-training or post-training evaluation indicates a need to do so.

4.4.3.2 A competency-based training and assessment programme for ATSEP shall include sufficient and appropriate practical and/or on-the-job training to ensure that the competencies appropriate to the exercise of duty are consistently achieved. Practical training should be performed under the supervision of an instructor qualified and competent in the technical domain for which the competency will be awarded. When on-the-job training is provided, the instructor shall be qualified and competent in the technical domain for which the competency will be awarded, and the training shall be conducted under the SMS of the ANSP. Refer to the guidelines for the implementation of competency-based training and assessment for ATSEP in 4.4.4

4.4.4 Guidelines for the Implementation of Competency-Based Training and Assessment for Air Traffic Safety Electronics Personnel (ATSEP)

General considerations: Approved training organizations and air navigation service providers may select to initially develop competency-based training and assessment for unit or continuation training. Detailed guidance on how to structure competency-based training and assessment for ATSEPs in different phases of training can be found in the Manual on Air Traffic Safety Electronics Personnel Competency-based Training and Assessment (Doc 10057).

4.4.5 The Competency Framework for Air Traffic Safety Electronics Personnel

4.4.5.1 The competency framework for air traffic safety electronics personnel provides the basis that shall be used to develop an adapted competency model suitable for the environment of the ANSP. Using this ATSEP competency framework will promote harmonization of competencies and enable the use of best practices in ATSEP training and assessment.

4.4.5.2 ATOs or ANSPs should use the adapted competency model to develop their training and assessment programmes.

4.4.5.3 The competency framework for air traffic safety electronics personnel is generic and does not address the specific type of technology in use, organizational schemes, or the scope of maintenance activities conducted.

THE COMPETENCY FRAMEWORK FOR ATSEP

Note 1.— This framework needs to be adapted to the local context of the organization. The competencies and observable behaviours in the table are not listed according to any pre-defined priority. Observable behaviours may include but are not limited to the observable behaviours listed in the table below.

Note 2.— The framework does not address the specific definition of duties, sharing of tasks, qualifications and proficiency levels existing in the organization.

Competency	*Definition*	*Observable behaviours (OB)*
Engineering	Collaborate in developing, modifying and integrating systems, networks and equipment	OB 1.1 Demonstrates technical knowledge and reasoning OB 1.2 Demonstrates ability of engineering reasoning and problem solving OB 1.3 Demonstrate the knowledge and reasoning of eroperability in terms of global systems and environments OB 1.4 Demonstrates ability to set system requirements OB 1.5 Develops modelling of system and ensures requirements be met OB 1.6 Manages development projects effectively OB 1.7 Designs implementation process effectively OB 1.8 Tests, verifies, validates and certifies new systems, uipment or installations OB 1.9 Supports system and equipment implementation OB 1.10 Optimizes systems and network elements OB 1.11 Supports system life cycle OB 1.12 Anticipates and organizes system and equipment decommissioning OB 1.13 Contributes to risk management processes

Competency	*Definition*	*Observable behaviours (OB)*
		OB 1.14 Determines, prescribes and ensures compliance of systems and network elements with the performance-based operational context OB 1.15 Manages system resources and safeguards them (e.g. frequency spectrum)
Situational awareness	Comprehend the current status of the ATM system and anticipate future events	OB 2.1 Monitors the CNS/ATM systems in own area of responsibility and contributing areas as well OB 2.2 Monitors the environmental conditions that have an impact on own and adjacent areas of responsibility and understands the impact on systems and services OB 2.3 Monitors the relevant elements of the ATC operational situation OB 2.4 Maintains awareness of the people involved in or affected by the operation OB 2.5 Obtains information from all available monitoring sources OB 2.6 Analyses information from all available monitoring sources OB 2.7 Predicts future system load (e.g. network, computing capacity and other parameters) OB 2.8 Identifies potentially hazardous situations OB 2.9 Checks for data integrity
Service provision	Ensure availability and reliability of CNS/ATM systems and capabilities	OB 3.1 Uses systems monitoring and diagnostic capabilities effectively OB 3.2 Evaluates the operational consequences of CNS/ATM system anomalies or failures OB 3.3 Switches from monitoring to intervention in a timely manner OB 3.4 Uses prescribed operation procedures properly OB 3.5 Ensures that technical interventions take into account the C operational situation OB 3.6 Coordinates technical interventions with other technical units, the different stakeholders and ATC OB 3.7 Monitors the execution of technical interventions OB 3.8 Uses a variety of methods to effectively manage system anomalies and degraded situations

Competency	*Definition*	*Observable behaviours (OB)*
Coordination	Manage coordination with operational stakeholders and with other affected stakeholders	OB 4.1 Coordinates effectively with internal stakeholders OB 4.2 Coordinates effectively with external stakeholders OB 4.3 Selects the coordination method based on circumstances and in a timely manner OB 4.4 Uses common coordination terminology as required by the prescribed operational procedures OB 4.5 Adjusts timing of coordination, taking into account current tors affecting the technical team OB 4.6 Conducts effective briefings during position handovers and transfer of maintenance tasks
Management of nonroutine situations	Detect and respond to emergency and unusual situations related to the ATC operation and/or CNS/ATM systems and capabilities	OB 5.1 Recognizes, from the information available, the possibility of an emergency, urgent or degraded situation developing OB 5.2 Determines the nature of the emergency OB 5.3 Prioritizes actions based on the urgency of the situation OB 5.4 Follows prescribed procedures for responding to nonroutine situations OB 5.5 Follows prescribed procedures for communication and coordination of urgent situations OB 5.6 Creates solutions when no procedure exists for responding to non-routine situations OB 5.7 Identifies potentially hazardous events requiring coordination with stakeholders
Problem solving and decision making	Find and implement solutions for identified hazards and associated risks	OB 6.1 Takes into account the existing rules and operating procedures when determining possible solutions to a problem OB 6.2 Implements a chosen solution to a problem OB 6.3 Organizes tasks in accordance with determined priorities OB 6.4 Applies appropriate mitigation strategies for the identified hazards OB 6.5 Works through problems without reducing safety OB 6.6 Considers expediency and efficiency in decision making

Competency	*Definition*	*Observable behaviours (OB)*
Self-management	Demonstrate personal attributes that improve performance and maintain an active involvement in selflearning and selfdevelopment	OB 7.1 Takes responsibility for own performance, detecting and resolving own errors OB 7.2 Improves performance through self-evaluation of the effectiveness of actions OB 7.3 Seeks and accepts feedback to improve performance OB 7.4 Maintains self-control and performs adequately in adverse situations OB 7.5 Changes behaviour and responds as needed to deal with the demands of the changing situation
Workload management	Use available resources to prioritize and perform tasks in an efficient and timely manner	OB 8.1 Manages tasks effectively in response to current and future workload OB 8.2 Determines if and when support is necessary based on workload OB 8.3 Delegates tasks when necessary to reduce workload OB 8.4 Selects appropriate tools, equipment and resources to support the efficient achievement of tasks OB 8.5 Contributes to balancing team workload in normal and nonroutine situations
Teamwork	Operate as a team member	OB 9.1 Provides feedback constructively OB 9.2 Shows respect and tolerance for other people OB 9.3 Carries out actions and duties in a manner that supports a team environment OB 9.4 Uses negotiating and problem-solving techniques to manage unavoidable conflict when encountered OB 9.5 Raises relevant concerns in an appropriate manner OB 9.6 Accepts feedback constructively OB 9.7 Shares experiences with the aim of continuous improvement
Communication	Communicate effectively in all situations	OB 10.1 Selects communication methods that take into account the requirements of the situation OB 10.1 Speaks clearly, accurately and concisely OB 10.3 Uses appropriate vocabulary and expressions for communications with stakeholders OB 10.4 Demonstrates active listening by asking relevant questions and providing feedback

Competency	*Definition*	*Observable behaviours (OB)*
		OB 10.5 Verifies comprehension of counterparts and corrects as necessary OB 10.6 Where applicable, uses eye contact, body movements and gestures that are consistent with verbal messages OB 10.7 Interprets non-verbal communication correctly

5. Training and Assessment for Aerodrome Personnel [Reserved]

6. Training and Assessment for Other Aviation Personnel [Reserved]