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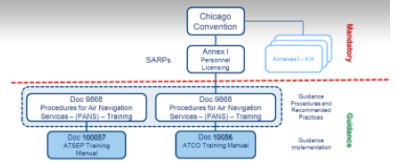
NGAP Implementation Workshop Introduction to PANS-TRG Document (ICAO DOC 9868)

Objectives

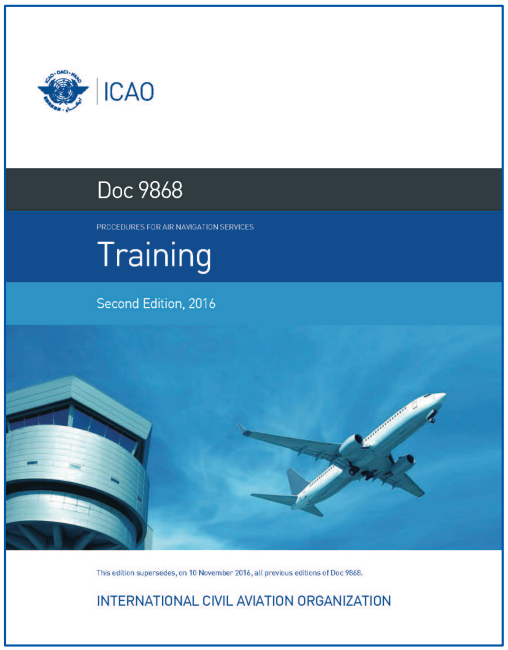
- What is PANS-TRG?
- Describe the structure of the PANS-TRG
- Describe recent amendments to PANS-TRG
- Explain Competency Frameworks & general implementation principles
- Describe relations between PANS-TRG and ATCO/ATSEP Training Manuals

What is PANS-TRG?

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.



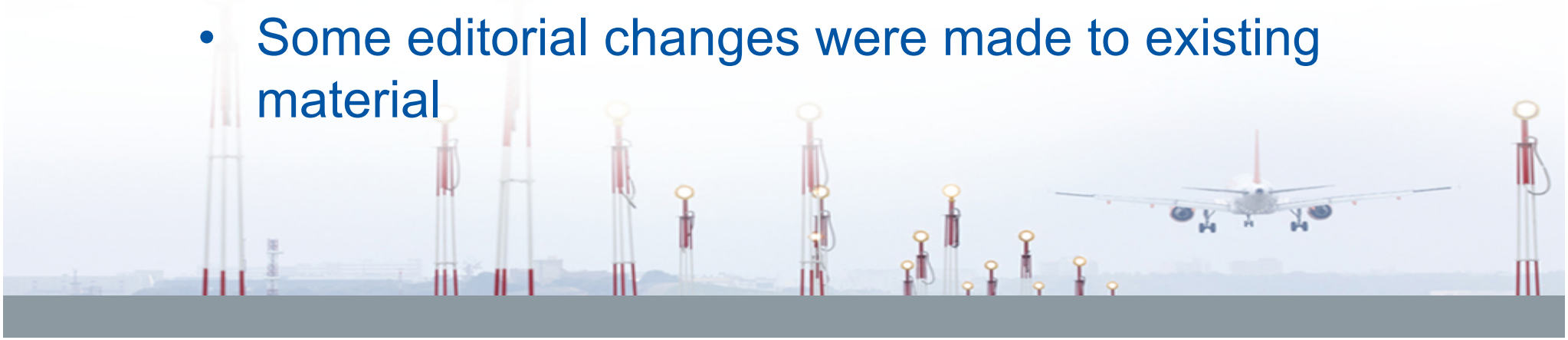
What is PANS-TRG?



- First published 2006 - originally only for pilots
- AMMTEs added in 2011
- EBT added in 2013
- Until recently only covered limited licensed personnel described in Annex 1
- Major changes introduced by Amendment 4 (applicable 10 Nov 2016)

What changed on 10 Nov 2016?

- Amendment 4 became applicable
- Document was re-structured & re-issued as the Second Edition, 2015
- Some editorial changes were made to existing material

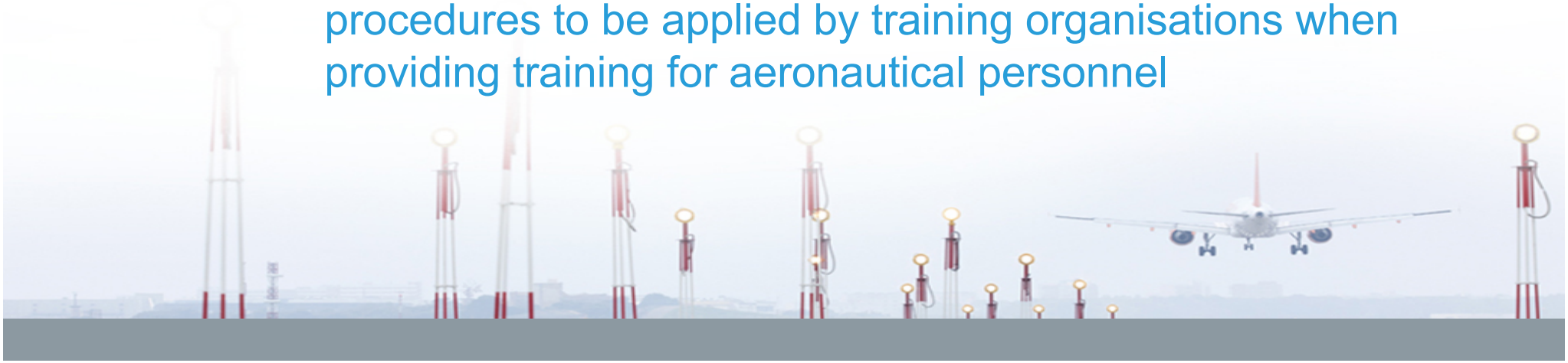


What changed on 10 Nov 2016?

- Competencies were added for ATCOs and ATSEPs
- For the first time provisions were made to cover all licensed personnel mentioned in Annex 1 and some non-licensed professions (i.e. ATSEP, cabin crew, etc.)

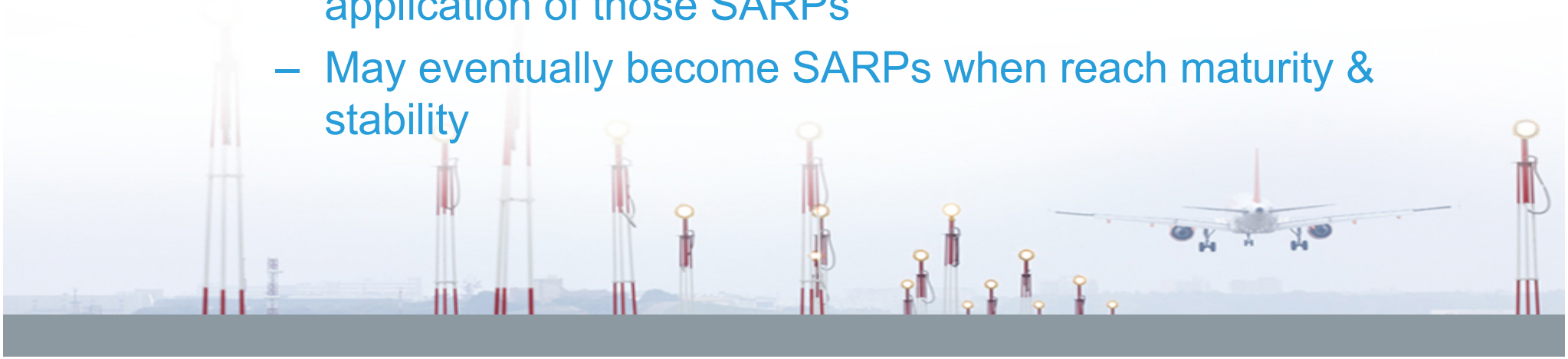
PANS-TRG Scope & Purpose

- PANS-TRG is complementary to the SARPs
- Specifies, in greater detail than in the SARPs, the actual procedures to be applied by training organisations when providing training for aeronautical personnel



PANS-TRG Status

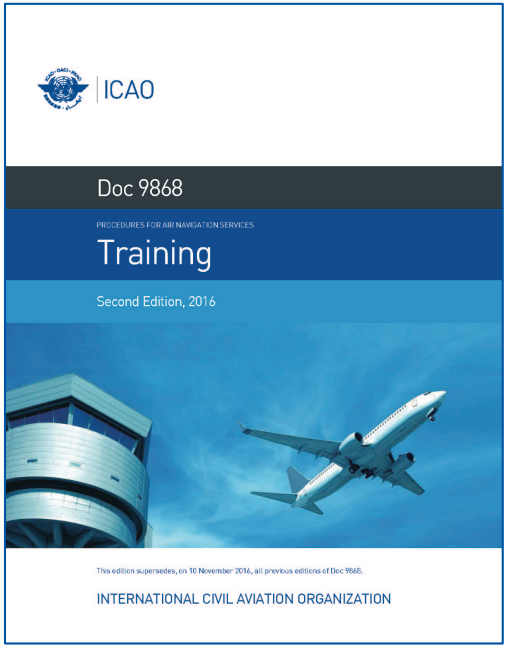
- Do not have the same status as SARPs
- May comprise material amplifying basic principles in the corresponding SARPs & designed to assist the user in application of those SARPs
- May eventually become SARPs when reach maturity & stability



PANS-TRG Implementation

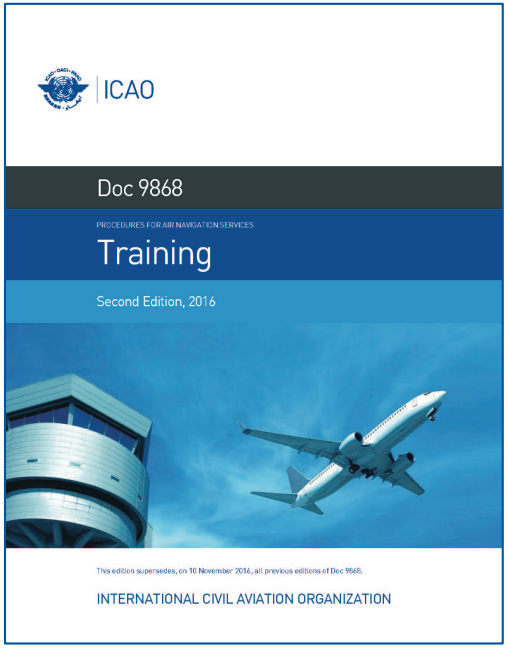
- Is the responsibility of Contracting States
- Applied in the actual training only after, and in so far as, States have enforced them
- Does not need notification in the event of non-implementation
- May need publication in AIP of significant differences

PANS-TRG Old Structure



- **Chapter 1** – Definitions and Acronyms
- **Chapter 2 -** General provisions for CBT and assessment
- **Chapter 3** – CBT and licensing for the multi-crew pilot licence (MPL)
- **Chapter 4** – CBT and assessment for aircraft maintenance personnel

PANS-TRG Old Structure



- **Chapter 5** – Evidence-based training (EBT)
- **Chapter 6 -** Competencies for flight crew training, course developer and instructor, and MPL examiner and inspector
- **Chapter 7** – Upset prevention and recovery training

PANS-TRG New Structure

Foreword

Part 1 General Procedures	Part 2 Training and Assessment for Aircraft Operational Personnel	Part 3 Training and Assessment for Aircraft Maintenance Personnel	Part 4 Training and Assessment for Air Traffic Management Personnel	Part 5 Training and Assessment for Aerodrome Personnel (Reserved)	Part 6 Training and Assessment for Other Aviation Personnel (Reserved)
Chapters 1 - 3	Sections 1 - 3 Chapters 1 - 5	Chapter 1	Chapters 1 - 3		

PANS-TRG New Structure

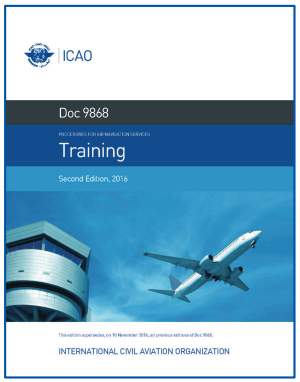
Part 1
General
Procedures

Chapters 1 - 3

Part 4
Training and
Assessment for
Air Traffic
Management
Personnel

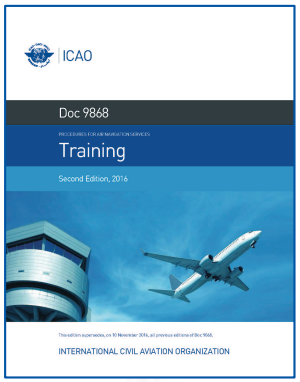
Chapters 1 - 3

Part 1- General procedures



- **Chapter 1** – Definitions and Acronyms
- **Chapter 2 -** General provisions for CBT and assessment
- **Chapter 3** – Qualifications of course developers and instructors

Part 4- Training & Assessment for ATM Personnel



- **Chapter 1** – General procedures for CBT&A for ATM personnel
- **Chapter 2** – CBT&A for ATCOs
  - Appendicles with Guidelines for implementation for ATCOs + CU, CE and PC (OB)
- **Chapter 3** – CBT&A for ATSEPs
  - Appendicles with Guidelines for implementation for ATSEPs + CU, CE and PC (OB)

Competency-based approach to training

Training and assessment that are characterised by:

- Performance orientation
- Emphasis on standards of performance and their measurement
- Development of training to the specified performance standards

Implementation of such training is optional

Basic Principles

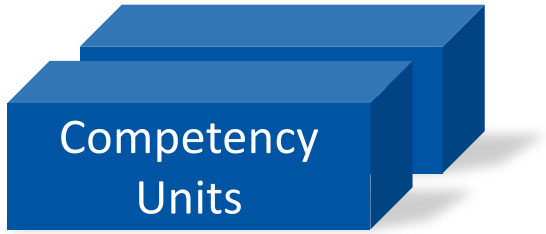
- The development of CBT&A shall be based on a systematic approach whereby:
  - competencies and their performance criteria are defined
  - training is based on the competencies identified
  - assessments are developed to determine whether these competencies have been achieved

Basic Principles

The training process consists of filling the gap between existing competencies and expected competencies through training and demonstrating the outcome in an assessment process.

What is a Competency Framework?

- A generic model
- It should be adapted to suit the variety of situations that exist worldwide in the ATM domain.
- It is structured and consists of defined building blocks.


Competency
Units

Local Adaptation =
Conditions + Standards

Competency Units

Assessment (Evidence) Guide

Observable Behaviour

Competency

A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard

Competency unit (CU)

A discrete function consisting of a number of competency elements

Competency element (CE)

An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome

Performance criteria (PC)

Simple, evaluative statements on the required outcome of the competency element and a description of the criteria used to judge whether the required level of performance has been achieved

Range of variables (conditions)

The conditions under which the competency units must be performed

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 units, competency elements and performance criteria shall be further developed from job and tasks analysis of ATM personnel and shall describe observable outcomes.

EXAMPLES

CU Coordination

Manage coordination between personnel in operational positions and with other affected stakeholders

CE

- *Determine the need for coordination*
- *Select appropriate method of coordination*
- *Perform coordination*

PC – Observable Behaviour

- *Coordinates with personnel in other operational positions and other stakeholders, in a timely manner*
- *Selects coordination method based on circumstances, including urgency of coordination, status of facilities and prescribed procedures*
- *Coordinates the movement, control and transfer of control for flights using the prescribed coordination procedures*
- *Coordinates changes of status of operational facilities such as equipment, systems and functions*

PC – Observable Behaviour

- *Coordinates changes of status of airspace and aerodrome resource*
- *Uses clear and concise terminology for verbal coordination*
- *Uses standard ATS message formats and protocol for non-verbal coordination*
- *Uses clear and concise non-standard coordination methods when required*
- *Conducts effective briefings during position handover*

Conditions

The trainee will be able to demonstrate an integrated performance of all the competencies under the following conditions:

- *High fidelity 360° simulated environment of Heathrow Tower*
- *Two parallel runways in single mode operations (AIR Departures)*
- *Use of all 4 possible runways (09L, 09R, 27L, 27R)*
- *Departures and VFR/SVFR overflights only*
- *In all weather conditions including CAT3C LVPs*

Conditions

The trainee will be able to demonstrate an integrated performance of all the competencies under the following conditions:

- *With the following traffic levels and complexity:*
  - *High traffic levels and complexity with contracted runway rate 40 aircraft/hour*
  - *Mix of IFR and VFR/SVFR (90/10 % ratio) with high percentage of H and J wake turbulence categories*
- *With the use of following tools and equipment:*
  - *Aerodrome Traffic Monitor displaying positions of aircraft within 25nm from Heathrow. PSR and SSR with Mode S.*
  - *EFPS, CPDLC, DMAN, SMR, RIMCAS, reconfigurable touchscreen communication panels*
- *Without any assistance or prompts from instructor*

Standards

The trainee will be able to demonstrate an integrated performance of all the competencies following procedures and standards described in:

- *Standardised European Rules of the Air (SERA)*
- *UK AIP*
- *National Regulations: CAP493, CAP413*
- *Manual of Air Traffic Services Part 2 Heathrow*
- *Letters of agreement with London Terminal Control Centre*

Examples of ATCO & ATSEP frameworks

ATCO COMPETENCY FRAMEWORK

Note 1.— Paragraph 3 of Appendix 2 states that this framework should be adapted to the local context of the organization. The framewo generic and is intended to be adapted to the operating environment and challenges of the organization as well as to the professional experience of AT It does not address the specific definition of duties, sharing of tasks, ratings and proficiency levels existing in the organization. Local implementation o framework includes selecting competencies appropriate to their local context. The competencies in the table are not listed according to any pre-de priority.

Note 2.— Performance criteria defined in the following table may serve one or more of the competency units and elements. The criteria us judge whether the required level of performance has been achieved is to be established by the ANSP and/or ATO.

Note 3.— The principles of threat and error management should be integrated in the development of competency-based training programmes.

COMPETENCY UNIT	DEFINITION	CE No.	COMPETENCY ELEMENT	PC No.	PERFORMANCE CRITERIA OBSERVABLE BEHAVIOUR
SITUATIONAL AWARENESS	Comprehend the current operational situation and anticipate future events	CE1.1	• Monitor the operational situation	PC1.1	• Monitors air traffic in own area of responsibility and nearby airspace
		CE1.2	• Scan for specific or new information	PC1.2	• Monitors the meteorological conditions that impact on own area of responsibility and nearby airspace
		CE1.3	• Comprehend the operational situation	PC1.3	• Monitors the status of the ATC systems and equipment
		CE1.4	• Anticipate the future situation	PC1.4	• Monitors the operational circumstances in nearby sectors to anticipate impact on own situation
		CE1.5	• Recognize indications of reduced situational awareness	PC1.5	• Acquires information from available surveillance and flight data systems, meteorological data, electronic data displays and any other means available
				PC1.6	• Integrates information acquired from monitoring and scanning into the overall picture
				PC1.7	• Analyses the actual situation based on information acquired from monitoring and scanning

ATSEP COMPETENCY FRAMEWORK

Note 1.— Paragraph 3 of Appendix 2 states that this framework should be adapted to the local context of the organization. The framework is generic and is intended to be adapted to the operating environment and challenges of the organization as well as to the professional experience of ATSEP. It does not address the specific definition of duties, sharing of tasks, qualifications and proficiency levels existing in the organization. Local implementation of this framework includes selecting competencies appropriate to their local context. The competencies in the table are not listed according to any predefined priority.

Note 2.— Performance criteria defined in the following table may serve one or more of the competency units and elements. The criteria used to judge whether the required level of performance has been achieved is to be established by the ANSP and/or ATO.

COMPETENCY UNIT	DEFINITION	CE No.	COMPETENCY ELEMENT	PC No.	PERFORMANCE CRITERIA OBSERVABLE BEHAVIOUR
ENGINEERING	Collaborate in developing, modifying and integrating systems, networks and equipment	CE1.1	• Develop specifications	PC1.1	• Demonstrates technical knowledge and reasoning
		CE1.2	• Design the technical system	PC1.2	• Demonstrates ability of engineering reasoning and problem solving
		CE1.3	• Support the technical system	PC1.3	• Demonstrate the knowledge and reasoning of interoperability in terms of global systems and environments
		CE1.4	• Install CNS/ATM systems into an operational context	PC1.4	• Demonstrates ability to set system requirements
		CE1.5	• Evaluate new technologies	PC1.5	• Develops modelling of system and ensures requirements can be met
		CE1.6	• Manage system operational life cycle	PC1.6	• Manages development projects effectively
		CE1.7	• Assess system performance in the performance-based operational context	PC1.7	• Designs implementation process effectively
		CE1.8	• Manage resources required for CNS/ATM systems and capabilities	PC1.8	• Tests, verifies, validates and certifies new systems, equipment or installations

Defined in the PANS-TRG framework & refined in adapted competency model

PC = Observable Behaviour + Conditions + Standards

Defined in adapted competency model

ATCO & ATSEP frameworks comparison

Competency Framework	ATCO	ATSEP
Competency Unit	10	10
Competency Element	36	43
Observable Behaviour	98	77

ATCO		ATSEP	
Competency Unit	Definition	Competency Unit	Definition
Situational Awareness	Comprehend the current operational situation and anticipate future events	Situational Awareness	Comprehend the current status of the ATM system and anticipate future events
Traffic and Capacity Management	Ensure a safe, orderly and efficient traffic flow and provide essential information on environment and potentially hazardous situations	Engineering	Collaborate in developing, modifying and integrating systems, networks and equipment

ATCO		ATSEP	
Competency Unit	Definition	Competency Unit	Definition
Separation and Conflict Resolution	Manage potential traffic conflicts and maintain separation	Service Provision	Ensure availability and reliability of CNS/ATM systems and capabilities
Communication	Communicate effectively in all operational situations	Communication	Communicate effectively in all situations
Coordination	Manage coordination between personnel in operational positions and with other affected stakeholders	Coordination	Manage coordination with operational stakeholders and with other affected stakeholders

ATCO		ATSEP	
Competency Unit	Definition	Competency Unit	Definition
Management of Non-Routine Situations	Detect and respond to emergency and unusual situations related to aircraft operations and manage degraded modes of ATS operation	Management of Non-Routine Situations	Detect and respond to emergency and unusual situations related to the ATC operation and/or CNS/ATM systems and capabilities
Problem Solving and Decision Making	Find and implement solutions for identified hazards and associated risks	Problem Solving and Decision Making	Find and implement solutions for identified hazards and associated risks

ATCO		ATSEP	
Competency Unit	Definition	Competency Unit	Definition
Workload Management	Use available resources to prioritise and perform tasks in an efficient and timely manner	Workload Management	Use available resources to prioritise and perform tasks in an efficient and timely manner
Teamwork	Operate as a team member	Teamwork	Operate as a team member

ATCO		ATSEP	
Competency Unit	Definition	Competency Unit	Definition
Self-Management and Continuous Development	Demonstrate personal attributes that improve performance and maintain an active involvement in self-learning and self-development	Self-Management and Continuous Learning	Demonstrate personal attributes that improve performance and maintain an active involvement in self-learning and self-development

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IMPLEMENTATION GUIDANCE

General implementation principles

- The use of competency frameworks is recommended but is not mandatory.
- Appendices to ATCO and ATSEP Chapters include guidelines for ATO, ANSP and Authority.

General implementation principles

- Competency frameworks defined in PANS-TRG shall be used as the basis for the development and approval of local CBT&A programmes.
- Local implementation includes selecting competencies appropriate to the local context.

General implementation principles

- All CBT shall be developed with the use of a systematic methodology such as ISD or equivalent.
- The competency-based training programme shall be composed of integrated theoretical and practical instruction.

General implementation principles

- Start by using the existing training programme as a reference and progressively implement the new CBT programme using ATCO Training manual (Doc 10056) or ATSEP Training Manual (Doc 10057) for guidance.
- Progressive manner means that successive evolutions of the training programme introduce higher level of CBT.

Guidelines for the authority

- Authorities shall develop and/or approve the assessment process for ATCOs including:
  - The assessment (evidence guide)
  - Range of variables (conditions)
  - Knowledge and skills standards required for assessing applicants

Guidelines for the authority

- Implementation of CBT requires blending of various types of training (theory and practical) with the media (classroom, simulation, OJT).
- Shall include a continuous evaluation of the training programme acceptable to the authority to ensure it effectiveness and relevance to real-time operations.

Guidelines for the authority

- This evaluation shall ensure that:
  - The competencies and related assessments are relevant to the specific context and environment to which ATCO/ATSEP may be assigned after training
  - The trainees acquire the necessary competencies in a progressive and satisfactory manner
  - Remedial actions are taken if evaluation indicates a need to do so

Guidelines for the authority

- First CBT programme should have provisional approval/validation.
- This subsequently should be confirmed only after obtaining a satisfactory result from first courses.
- All relevant provisions for ATCO/ATSEP training including those dealing with approval of the curriculum and quality assurance system (DOC 9841) apply.

Guidelines for the authority

- Oversight shall be exercised during the initial implementation.
- The success of the implementation depends on effective coordination and cooperation between the authority, the ATO and the ANSPs.
- Authorities should encourage and facilitate such cooperation and coordination.

ATCO/ATSEP implementation specifics

Some very high level guidance in PANS –TRG Part 4
(see appendices to Chapters 2 & 3)

See these for more details

ATCO
Doc 10056

ATSEP
Doc 10057

Questions & further guidance

- PANS-TRG (Doc 9868)
- ATCO Training manual (Doc 10056)
- ATSEP Training manual (Doc 10057)
- Manual on the Approval of Training Organisations (Doc 9841)

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