



ICAO

UNITING AVIATION

Competency-based training and assessment

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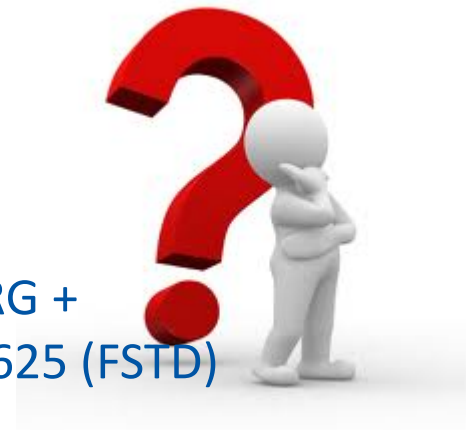
TO/PEL

HIGH LEVEL SEMINAR ON LOC-I AND UPRT

(Johannesburg, 19 October 2017)

Outline

- What is the difference between CBTA & traditional training
- What is ICAO policy
- Scope of Amendment 5 to PANS-TRAINING
- Competency-based training and assessment (CBTA) principles
- CBTA benefits
- The ICAO Competency framework
- CBTA workflows
- Consequential amendments to Annex 1 and PANS-TRG + Doc 9379 (PEL system), 9841 (ATO), 10011 (UPRT), 9625 (FSTD)
- CAA safety oversight of CBTA
- Conclusions



Differences between CBTA & Traditional Training

- **Traditional training – qualification-based:**



- ❖ Meeting/maintaining the qualifications requirements (Annex 1/National regs)
- ❖ expressed in **quantitative** terms that prescribe training programme “**inputs**” (e.g. required hours of study, hours of practice, etc.)
- ❖ programme design and content are also influenced by the CAA’s testing criteria and methods

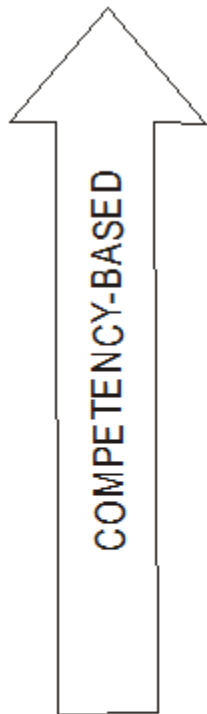
- **Competency-based training programme:**

- ❖ an integrated and “**outcomes-focused**” training programme aimed at providing the graduates with the **competencies** to be safe, highly effective and efficient in the performance of their duties
- ❖ Programme design requirements: training needs analysis; adapted competency model; training and assessment plans; LMS
- ❖ Feedback on training & graduate’s performance is critical for evaluation of course

Experienced course developers



Differences between CBTA & Traditional Training



Training designed to ensure that graduates possess the required competencies to safely, efficiently and effectively carry out their assigned duties and responsibilities at the workplace

Training designed to ensure that graduates demonstrate the necessary minimum skill, knowledge and experience levels to meet the qualification requirements of the licence, rating or privilege



ICAO Policy

- **A38-12: Consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation:**

- ❖ **APPENDIX D - Qualified and Competent Aviation Personnel**

Whereas the satisfactory implementation of SARPs and PANS is contingent upon having **qualified and competent personnel**

- ❖ **Associated practices**

- The Council should assist Member States to **harmonize aviation professionals' levels of competency**. These efforts should be **based on**:
 -
 - **a competency-based approach.**

Competency-based approach - latest changes

Amendment 5 to the **Procedures for Air Navigation Services — Training** (PANS-TRG, Doc 9868) – **Applicable 5 November 2020**

Definitions
Interlinked concepts
Design methodology



Need for change

PANS-TRAINING currently contains

- General provisions for competency-based training and assessment
- Training and assessment for:
 - multi-crew pilot licence → EBT
 - aircraft maintenance personnel
 - air traffic management personnel
 - Other disciplines to be developed, e.g. aerodrome personnel

However:

- Some training and assessment are task-oriented – e.g. MPL
- Some training and assessment are based on observing behaviours that contribute to a superior performance on the job
- **Need for a system of competence measurement that looks at the total performance, rather than singles tasks**



Scope of the amendment

- **Amendment 5 to the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868) provides:**
 - Revision/removal/addition of definitions for terms related to competencies
 - a description of how competency-related concepts are interlinked
 - a generic methodology to design competency-based training and assessment

Key component:
Instructional systems design (ISD) methodologies



What is a competency?



Revised

- ***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.

Explaining the terms

Competency is manifested and observed through behaviours...

- **Observable behaviours** are single job-related behaviours that can be observed and may or may not be measurable

Competency
→ actions

... those behaviours mobilize the relevant knowledge, skills and attitudes to carry out activities or tasks under specified conditions

- **Knowledge** is specific information used to enable a person to apply skills and attitudes and to recall facts, identify concepts, apply rules, procedures or principles
- **Skill** is an ability to perform an activity or action.

Can be
learned &
developed

Internal
qualities

Attitude is a persisting 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.

Competency-based training and assessment (CBTA) principles

- 1) **Relevant competencies** are clearly defined for a particular role within an aviation discipline
- 2) Competencies can be **trained for, observed and assessed consistently**
- 3) Common understanding of the competency requirements.
- 4) **Clear performance criteria** are established by the training provider for assessing competence.
- 5) **Evidence of competent performance** is valid and reliable.
- 6) Link between competencies and training, required performance and assessment
- 7) Assessment based on **multiple observations across multiple contexts**.
- 8) Demonstration of an integrated performance of all the required competencies

Why CBTA matters?

- 1) Enables individuals to reach their highest level of operational capability while ensuring a basic level of competence as a minimum standard.
- 2) Enables individuals to cope with predictable and unforeseen situations.
- 3) Is relevant to the job and the context in which the job will be performed
- 4) Is geared towards **learning** rather than passing a **test**
- 5) Makes full use of available training tools and methodologies
- 6) Supports continuous learning and performance improvement

First step



ICAO Competency Framework

The first step is for ICAO to define a Competency Framework for a given aviation discipline

- 1) An ICAO competency framework is a selected group of competencies for a given aviation discipline.
- 2) The competency framework consists of a set of competencies for one specific discipline
- 3) It supports the establishment of a systematic approach by providing a generic model that should be adapted to suit the variety of situations/contexts that exist worldwide
- 4) Each competency has an associated description and observable behaviours
- 5) It is a generic blueprint to guide the development and maintenance of a strong workforce

ICAO
Competency
Framework
for
Aeroplane
Pilots

Structure of an ICAO Competency Framework

Table I-2-1. Structure of an ICAO competency framework

<i>ICAO competency</i>	<i>Description</i>
ICAO Competency 1	Description
ICAO Competency 2	Description
ICAO Competency x	Description x

ASSUMPTIONS

- 1) Competencies are applied to individuals
- 2) All tasks require the application of a set of competencies
- 3) Same set of competencies throughout a career (but with different degrees of performance)

Observable behaviour (OB). A single role-related behaviour that can be observed and may or may not be measurable.

COORDINATION

Aviation Discipline	Description	Observable Behaviours
ATC	Manage coordination between personnel in operational positions and with other affected stakeholders	<ul style="list-style-type: none"> • Determine the need for coordination • 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, transfer of control and changes of previously coordinated data for flights, 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 • 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

Setting the scene for training



CBTA Workflows

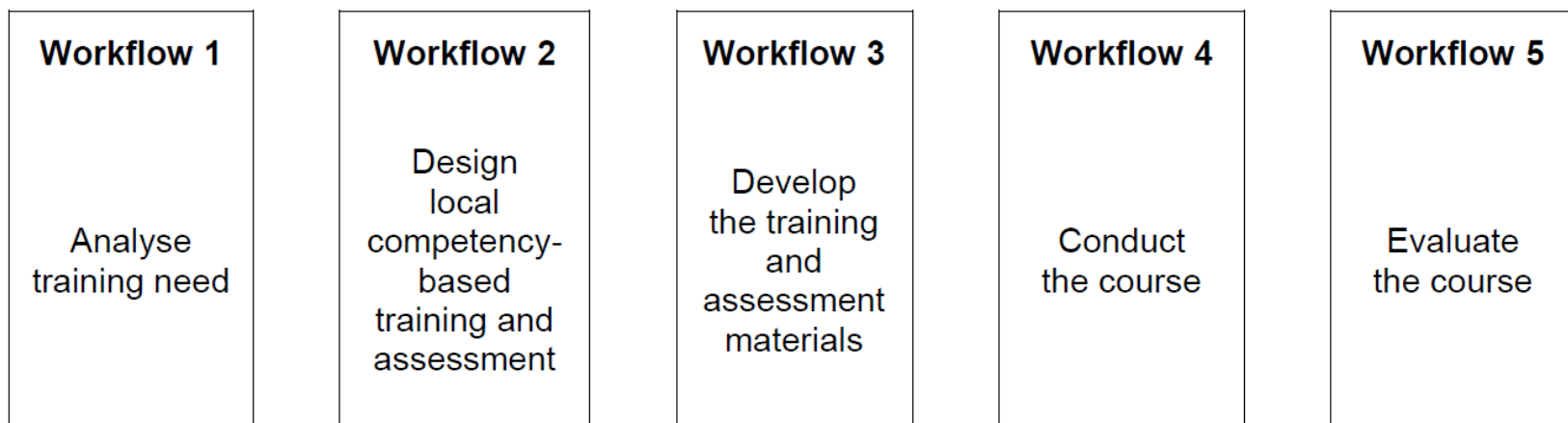
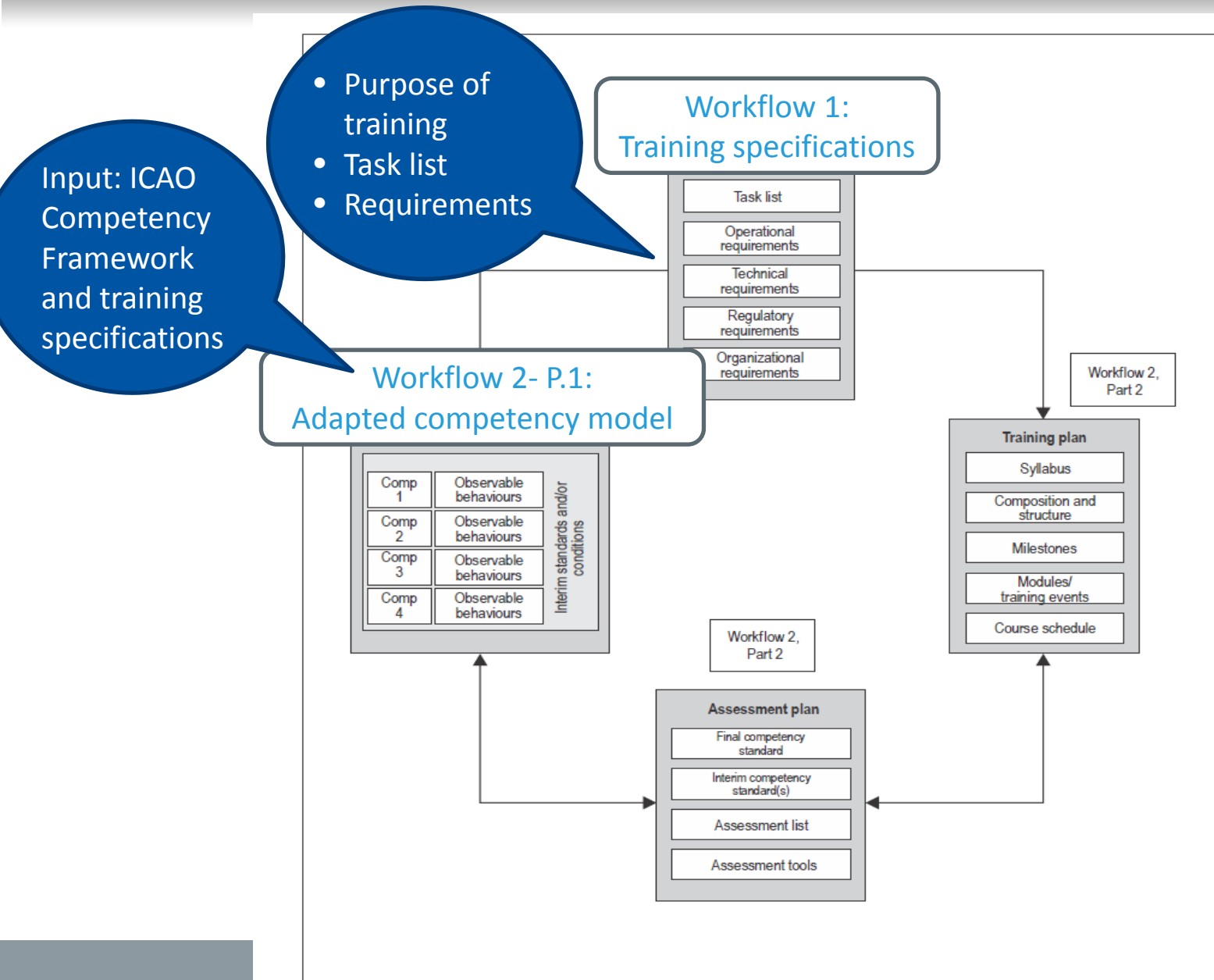


Figure I-2-C-1. Competency-based training and assessment workflows

Relationship between workflow 1 and 2



Adapted Competency Model

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

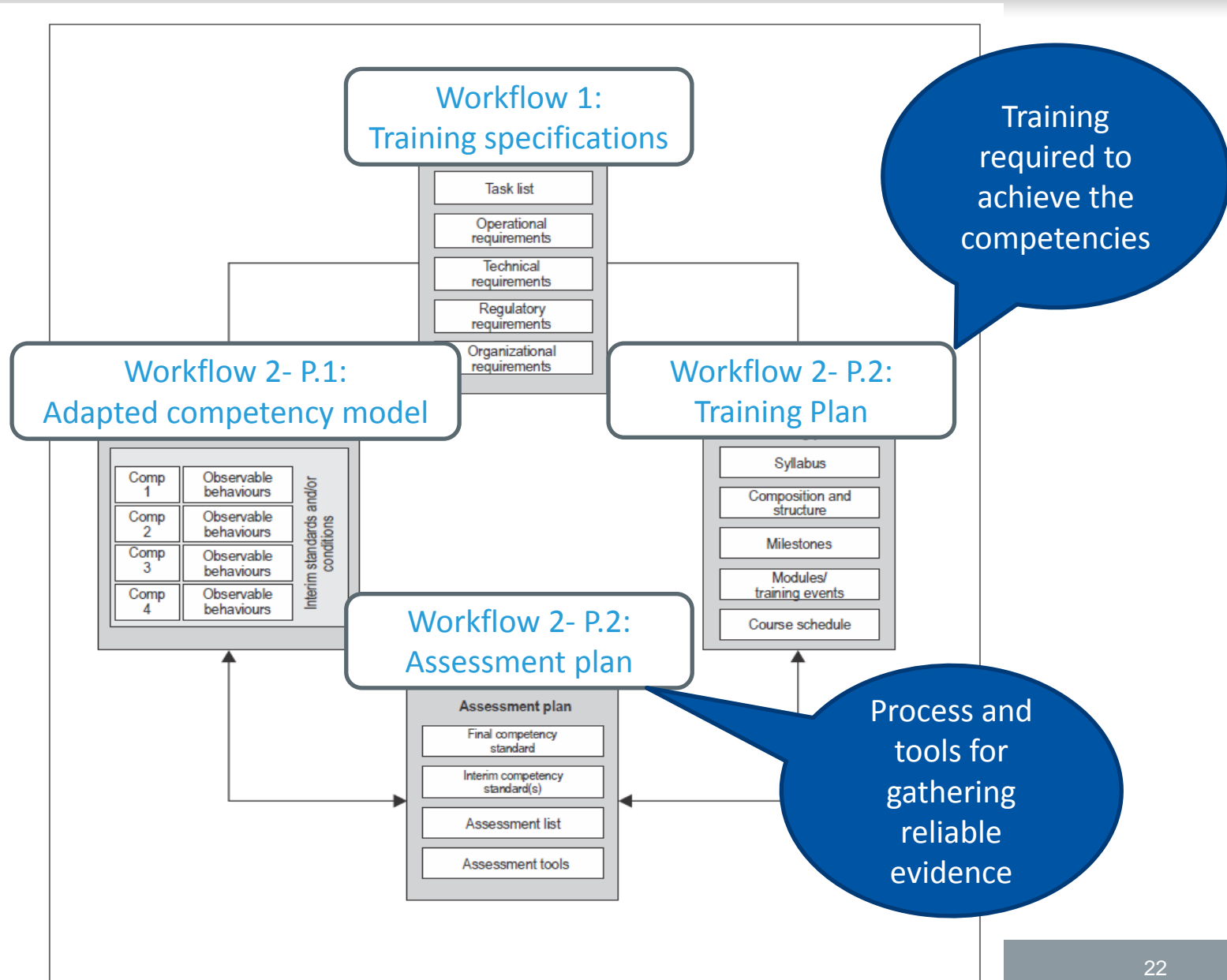


Components of an adapted competency model

Table I-2-3. Elements of an adapted competency model

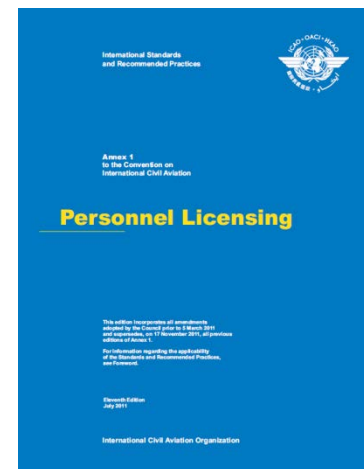
<i>Adapted competency</i>	<i>Description</i>	<i>Performance criteria</i>		
		<i>Observable behaviour (OB)</i>	<i>Competency assessment</i>	
Adapted competency 1	Description 1	OB 1	Final competency standard	Conditions
		OB 2		
		OB x		
Adapted competency 2	Description 2	OB 1		
		OB 2		
		OB x		
Adapted competency x	Description x	OB 1		
		OB 2		
		OB x		

Relationship between workflow 1 and 2



Consequential amendments to align with Amendment 5

- Annex 1:
 - ❖ Definitions: related to competencies
 - ❖ References to PANS-TRG
 - ❖ MPL provisions:
 - Alignment of text with Amdt 5
 - Replacement of MPL competency units [phases of flight] by an **adapted competency framework** based on the **ICAO aeroplane pilot competency framework**
 - Review of FSTD descriptions for phases of training
 - Deletion of Attachment B (levels of competency – not aligned with Amdt 5)
 - ❖ New provisions for the remote pilot licence



Consequential amendments to align with Amendment 5

- PANS-TRG:
 - ❖ New ICAO competency framework for aeroplane pilot
 - ❖ Rework entirely the MPL Chapter, deleting some material – transferring other
 - ❖ Revise the Evidence-based Training (EBT) Chapter
 - ❖ Revise the UPRT Chapter (minor)
 - ❖ New TEM Chapter (from existing attachment)
 - ❖ New Remote Pilot Licence competency framework
 - ❖ Rework entirely the maintenance personnel part
 - ❖ Minor update to ATM personnel part
 - ❖ New ICAO flight dispatcher competency framework



Consequential amendments to align with Amendment 5

- Align manuals with Amdt 5:
 - ❖ Doc 9379 - Manual of Procedures for Establishment and Management of a State's Personnel Licensing System + Remote pilot licence + guidance on examiners
 - ❖ **Doc 9841** - Manual on the Approval of Training Organizations + recognition of the approval of foreign ATOs
 - ❖ Doc 10011 - Manual on Aeroplane Upset Prevention and Recovery Training + Rev 3 of the Airplane Upset Prevention and Recovery Training Aid
 - ❖ Doc 9625 - Manual of Criteria for the Qualification of Flight Simulation Training Devices
 - ❖ Doc 9995 - Manual on Evidence-Based Training

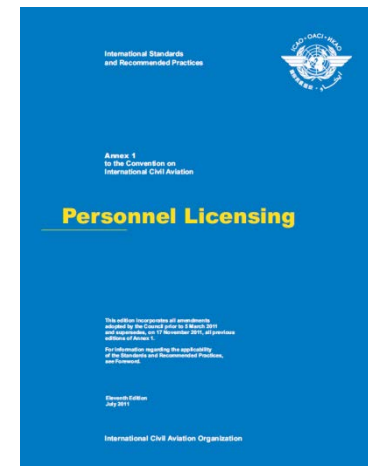
Consequential amendments

Timeline

- Annex 1 and PANS-TRG: applicable November 2020
- All manuals: before Q3 2018

CAA Oversight of CBTA

- Establish a regulatory framework for the CBTA to be conducted in an ATO, including the ATO's duties and role
- Guidance material to cover:
 - ❖ MPL and RPL
 - ❖ CBTA design
 - ❖ conduct of CBTA and final assessment
 - ❖ CBTA instructor qualifications, including assessment
 - ❖ CBTA designated examiner qualifications
 - ❖ CBTA inspector qualifications
 - ❖ Inspector procedures for CBTA oversight (approval/surveillance)



CAA Oversight of CBTA

- Qualifying inspectors for approving ATO's CBTA training programmes: **specific training**

ICAO
Competency
Framework

+ OJT

- ❖ CBTA principles in PANS-TRG: generic methodology, ICAO Competency Framework, adapted competency model - including performance criteria
- ❖ Regulations on CBTA
- ❖ Understanding and **use** of CAA guidance material
- ❖ Approval of CBTA training programme: adapted competency model, training and assessment plans, training conduct and course evaluation
- ❖ Approval of qualifications for the CBTA instructors and ATO designated examiners

- Duties: conduct a normal ATO approval process (as for traditional ATOs) PLUS

Proof-of-
concept
trial

- ❑ Approve CBTA training, including the adapted competency model and the training and assessment plans, and inspection of actual conduct of CBTA
- ❑ Approve qualifications programmes for CBTA instructors & designated examiners
- ❑ Qualify FSTDs and approve systems used for CBTA training, if applicable
- ❑ Conduct surveillance of the ATO and its training programme + monitor graduates performance on the job

CAA Oversight of CBTA

- The burden for the CAA is high in terms of new regulations and producing guidance material
- Inspector training is paramount and significant – CBTA is a new domain
- The inspector job is more complex than for traditional training:
 - No tick box approach
 - Each ATO adapted competency model is different → there is no one-size fits all – and performance criteria are different for each training programme
 - On-going surveillance implies good understanding of the adapted competency model developed and used by each individual ATO

Summary

- A new Competency-Based Training and Assessment Approach has been created.
- The new approach is more effective, it enables individuals to reach their highest level of operational capability and it is relevant to the job and the context in which the job will be performed
- The burden for the CAA is high in terms of new regulations and producing guidance material
- Inspector training is paramount and significant – CBTA is a new domain
- The inspector job is more complex than for traditional training

