CBTA Expansion

Opportunities and Challenges

Capt. David Swarbrick
Training Manager Boeing - Emirates

F-PLN

- **Introduction**

- Industry Role

- Expansions

- Opportunity

- Challenges

Introduction

Definition:

"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". (ICAO)

- Training is relevant to the role.

- Achieve a more effective ratio between learning opportunities and checking/assessment. Shift towards more learning opportunities.

- Ensure the integration of knowledge, skills and attitudes (KSA) needed to perform effectively,

- Ensure that the full potential of training tools and methodologies is exploited.

- Support continuous learning and performance improvement over the span of an aviation professional's career.

- Achieve transfer of KSA across contexts and operational situations; and

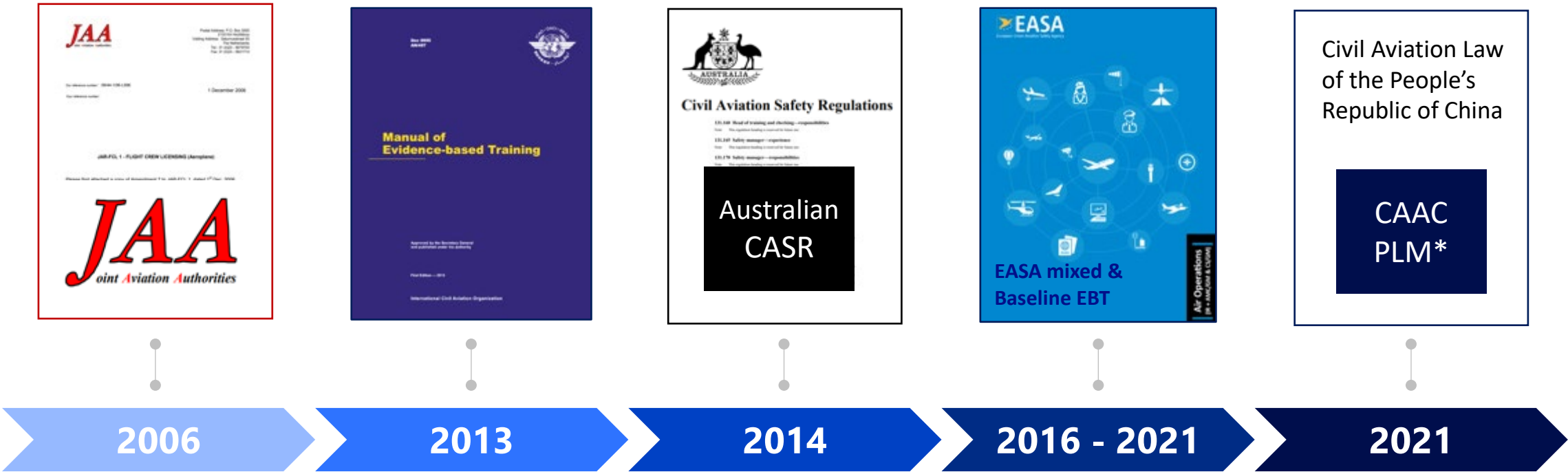- Establish well-trained and competent instructors.

Introduction

- CBTA **extends** the scope and nature of the training and the enhancement of the measurement of the performance.

- Traditional training, focuses on training mainly three technical elements: handling skills, automation management and application of procedures.

- CBTA assesses**, develops, and enhances** the nine pilot competencies and the four Instructor/Evaluator competencies.
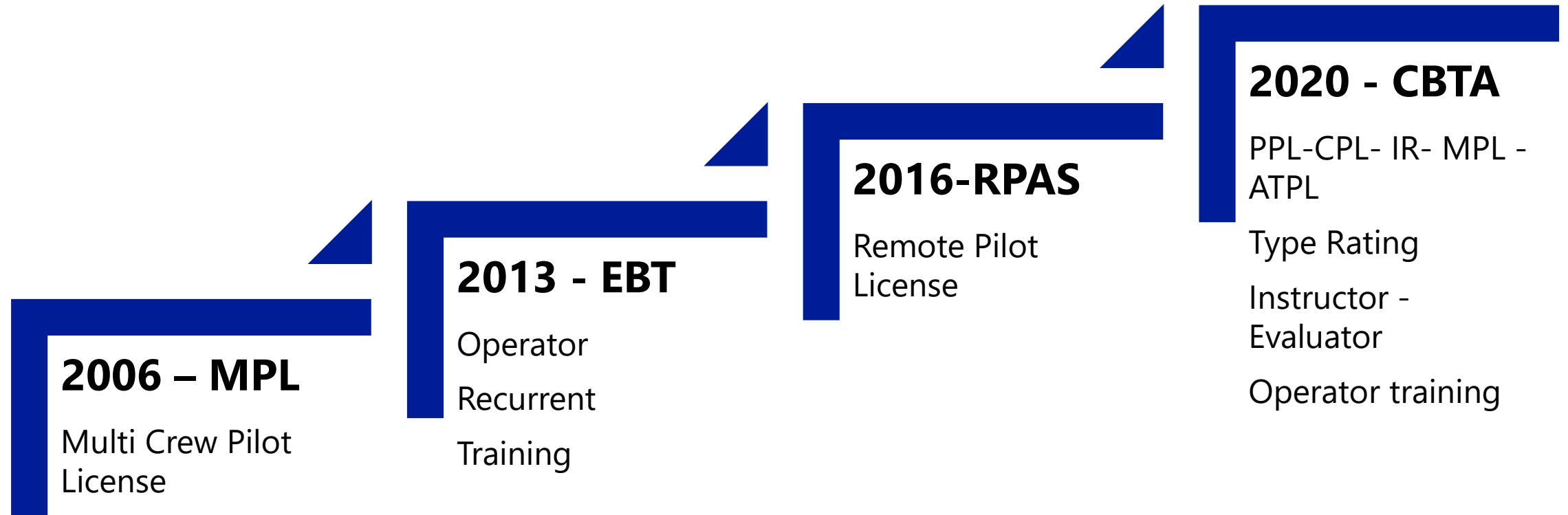
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Global expansion of CBTA - EBT

2006	2013	2014	2016 - 2021	2021
JAA — Joint Aviation Authorities	Manual of Evidence-based Training	Australian CASR	EASA mixed & Baseline EBT	Civil Aviation Law of the People's Republic of China — CAAC PLM*

Yann Renier – HoT IATA

ICAO CBTA Standards for pilots

2006 – MPL

Multi Crew Pilot License

2013 - EBT

Operator Recurrent Training

2016-RPAS

Remote Pilot License

2020 - CBTA

PPL-CPL- IR- MPL - ATPL

Type Rating

Instructor - Evaluator

Operator training

Yann Renier – HoT IATA

ICAO Personnel Training and Licensing Panel

- 25 members + 120 advisors and observers Total #150

- 3 Aviation disciplines represented: ATCOs, Maintenance and Pilots

- 4 working groups [CBTA, FSTD, Automation, Women-Minorities]

- 34 Working Program Elements [21 WPE CBTA related], such as

  o CBTA route in Annex 1,

  o License recognition,

  o FSTD qualification criteria vs Competency development,

  o Advance Air Mobility training & licensing issues etc.

<u>Next panel plenary session, 04-08 November, Montreal</u>

Pilot Training and Licensing Task Force

- Chair: Captain David Swarbrick
- Vice Chair: Captain Hiroshi Horikawa
- Creation: August 2014
- Provide expertise to IATA
- Products one Guide per year

2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Guidance Material and Best Practices for the Implementation of Upset Prevention and Recovery Training — 2nd Edition	Guidance Material for Improving Flight Crew Monitoring — 1st Edition	Guidance Material for Instructor and Evaluator Training — 1st Edition	Pilot Aptitude Testing Edition 3 — Guidance Material and Best Practices	Command Training Edition 1 — Guidance Material and Best Practices	Competency Assessment and Evaluation for Pilots, Instructors and Evaluators — Guidance Material	Instructor and Evaluator Training Edition 2 — Guidance Material and Best Practices	?

+ EBT data report update in 2021

IATA CBTA Manual

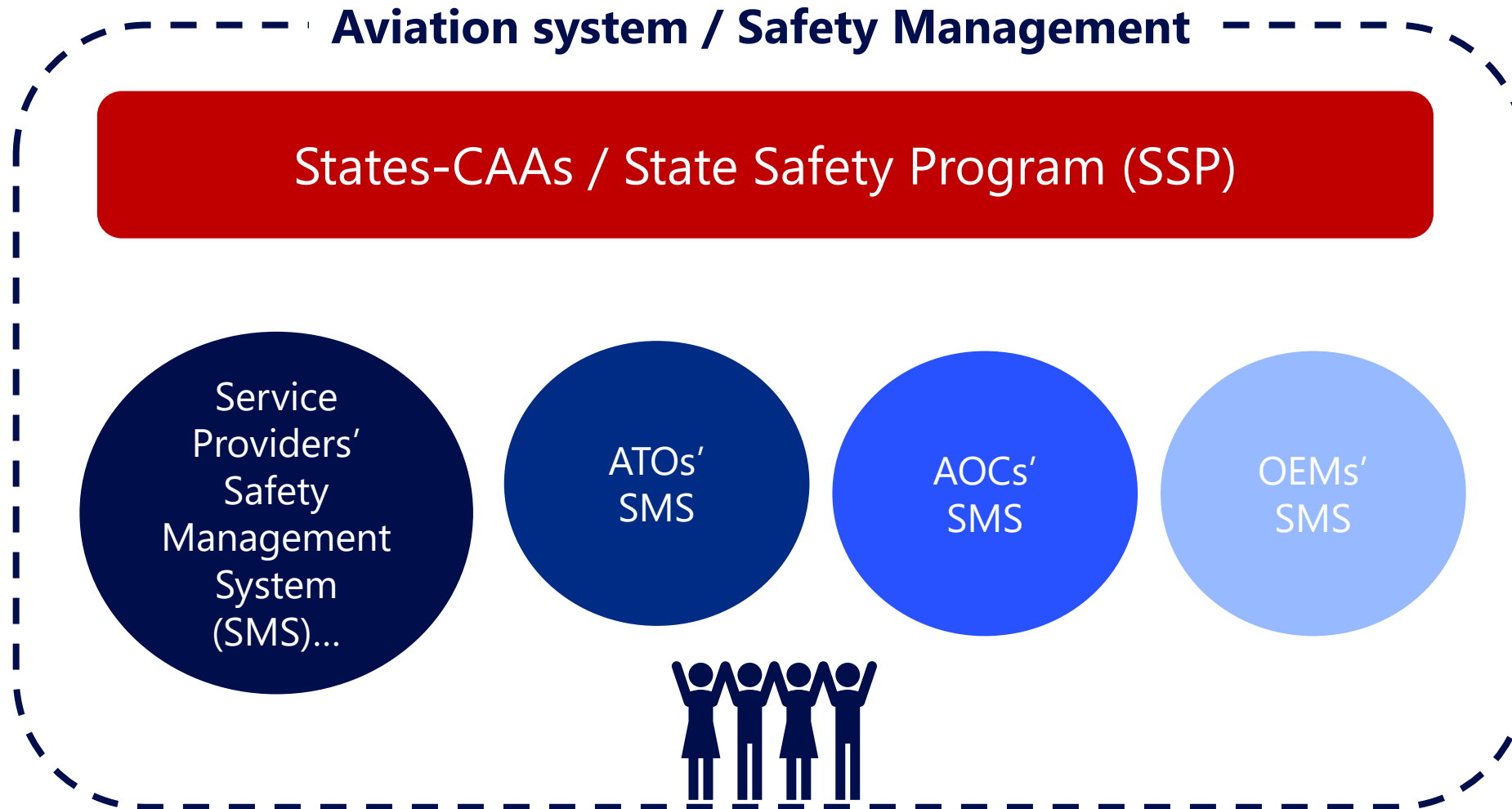| Modules	Content
M 1. Introduction	1.1 Purpose, 1.2 TSA, 1.3 Historical, 1.4 Expansion of CBTA
M 2. Generalities	2.1 Competencies (from HF, via CRM skills to role in TEM), 2.2 Competency assessment, 2.3 ISD (ADDIE), 2.4 Special Emphasis in training
M 3. CBTA for pilot and instructor training	3.1 Role of CBTA in SMS, 3.2 Expected benefits, 3.3 Challenges 3.4 training data
M 4. Screening & Selection	4.1 PAT Guide Update
M 5. Licensing training	5.1 MPL Guide update, _5.2 CPL-IR (TBD)_
M 6. Operator Training	6.1 EBT IMP Guide Edition 2 6.2 Command Course Guide _6.3 Conversion course_
M 7. Additional training	7.1 Instructor Evaluator Guide
M 8. Specific training	8.1 UPRT 8.2 Flight Crew Monitoring
M 9 Common Annexes	Pilot competencies, Instructor-Evaluator competencies

Underlined means: to be created

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"Total system safety approach"

Aviation system / Safety Management

States-CAAs / State Safety Program (SSP)

Service Providers' Safety Management System (SMS)...

ATOs' SMS

AOCs' SMS

OEMs' SMS

Safety Management framework

States-CAAs State Safety Program (SSP)	Service Providers' Safety Management System (SMS)

• Safety policy, objectives (and resources)
• Safety risk management
   ○ Hazard identification (from data collection) and risk management
   ○ Licensing, certification, authorization and approval obligations (CE-6)
   ○ Resolution of safety issues (CE-8)
   ○ Accident Incident investigation (Annex 13)
 	
• Safety assurance
• Safety promotion
	• Safety policy, objectives (and resources)
	• Safety risk management
	   ○ Hazard identification
	   ○ Safety risk assessment and mitigation
	
	• Safety assurance
	• Safety promotion

Hazard Identification

Example of hazard identification methodology		
Reactive	Reactive/Proactive	Proactive
E.g., Analysis Accident-Incidents	E.g., Analysis of event including Undesired Aircraft States	E.g., Analysis of Threat and Error Management
Safety Report 2019 (IATA)	Flight Data Analysis (FDA); Mandatory Occurrence reporting	Line Oriented Safety Audits (LOSA); Voluntary Safety reporting

Safety Data

States [• Accident/incident database • State audits • National aviation reviews • State safety programme • SPIs and SPTs • ICAO USOAP • In-flight medical incapacity database • Other state partner]

Civil aviation authority [• Mandatory occurrence reports • Voluntary reports • Risk assessments • Risk profiles • Industry SPIs/trend analysis • Service provider surveillance • External and internal audits • Enforcement records • Incident/accident reports • **Certification records** • Aircrew in-flight medical incapacity reports • Trends in medical assessment findings]

Approved training organizations (ATOs)
• Mandatory occurrence reports
• Voluntary reports
• Risk assessment register
• SPIs trend analysis
• Quality assurance reports
• **Training data**

Air operators (AOCs)
• Mandatory occurrence reports • Voluntary reports
• Flight data analysis (FDA) • Recorded data (flight data recorder, cockpit voice recorder, video...)
• Fatigue risk management system
• Risk assessment register • SPIs/trend analysis
• Maintenance records • Internal audits
• Reliability programme reports
• **Training records**

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CBTA Training Data, Metrics

Example of CBTA grading metrics
(based on EASA)

Level 0 (competent metrics): The information whether the pilot(s) is (are) competent or not.

Level 1 (competency metrics): Level of performance reflected by numeric grade of the competencies (e.g., 1 to 5).

Level 2 (observable behavior metrics): The instructors record OBs predetermined or required by the organization (Regulatory or Policy requirements).

Level 3 (TEM metrics): The instructor records Threats, Errors or Reduction of Safety Margin predetermined or required by the organization.

CBTA data

FPA OB 3.6 Effectively monitors automation, **Missing**

SAW OB 7.3 Monitors and assesses the general environment as it may affect the operation, **Missing**

LTW OB 5.10 Applies effective intervention strategies to resolve identified deviations

THREAT

ERROR

Limited and Momentary Reduction of Safety Margins

U A S

THREATS (occurs outside the influence of the flight crew)
E - Environmental Threats
E01 **Meteorology (see breakdown)**
    E01.01 Thunderstorm
    E01.02 Poor visibility/IMC
    E01.03 Gusty wind/ windshear
    E01.04 Icing conditions
    E01.05 Hail
E02 Lack of Visual Reference
E03 Air Traffic Services
E04 **Birds/foreign objects**
    E04.01 Birds
    E04.02 Wildlife
    E04.03 Foreign objects

ERRORS (flight crew deviation)
H - Aircraft Handling Errors
H01 Manual handling/Flight Controls
H02 Ground Navigation (Surface nav)
H03 Automation (settings/selections)
H04 Systems/Radio/Instruments (settings/selections)
H99 Other
P – Procedural Errors
P01 **SOP adherence/ cross-verification (see breakdown)**
    P01.01 Intentional
    P01.02 Unintentional
    P01.03 Unknown
P02 **Checklist (see breakdown)**
    P02.01 Normal checklist (error)
    P02.02 Abnormal checklist (error)

UNDESIRED AIRCRAFT STATES (flight crew induced, recoverable)
U - Aircraft Handling
U01 Abrupt Aircraft Control
U02 Vertical, Lateral or Speed Deviations
U03 Unnecessary Weather Penetration
U04 Unauthorized Airspace Penetration
U05 Operation Outside Aircraft Limitations
U06 Unstable Approach
U07 Continued Landing after Unstable Approach
U08 Long, Floated, Bounced, Firm, Off centerline, Canted, Porpoised Landing
U09 Rejected Take-off after V1
U10 Controlled Flight Toward Terrain
U99 Other

Threat and Error Management

Under **CBTA,** Threat and Error Management (TEM) is **naturally and fully embedded** in the training curriculum. The pilot and Instructor Evaluator (IE) competencies provide individual and team countermeasures to threats and errors **to avoid a reduction of safety** margins during training and operations.
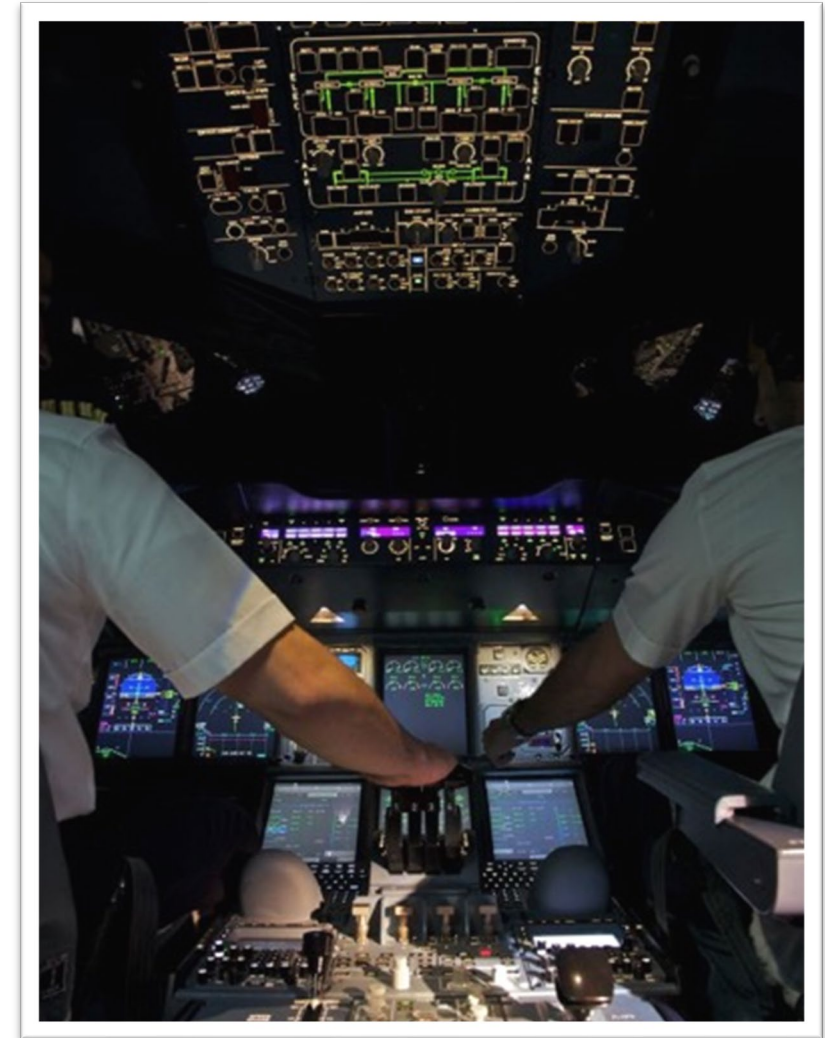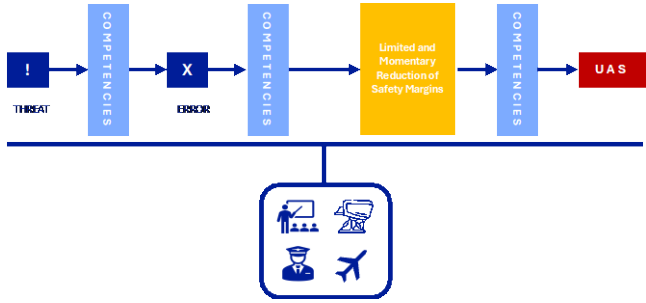
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Opportunities

Global Safety Management enhancements by:

- **Supporting proactive-predictive hazard identification**

Example of hazard identification methodology			
Reactive	Reactive/Proactive	Proactive	Proactive/Predictive
E.g. Analysis Accident-Incidents	E.g. Analysis of event including Undesired Aircraft States	E.g. Analysis of Threat and Error Management	E.g. Analysis of CBTA -EBT Training metrics
IATA Safety Report 2019	Flight Data Analysis (FDA) / Mandatory Occurrence reporting	Line Oriented Safety Audits (LOSA) / Voluntary Safety reporting	THREAT → COMPETENCIES → ERROR → COMPETENCIES → Limited and Momentary Reduction of Safety Margins → COMPETENCIES → UAS

Opportunities

Global Safety Management enhancements by:

- **Providing more robustness to the licensing system (CE-6)**

From a Pass/Fail Licensing system...
[Focus on 3 technical skills]

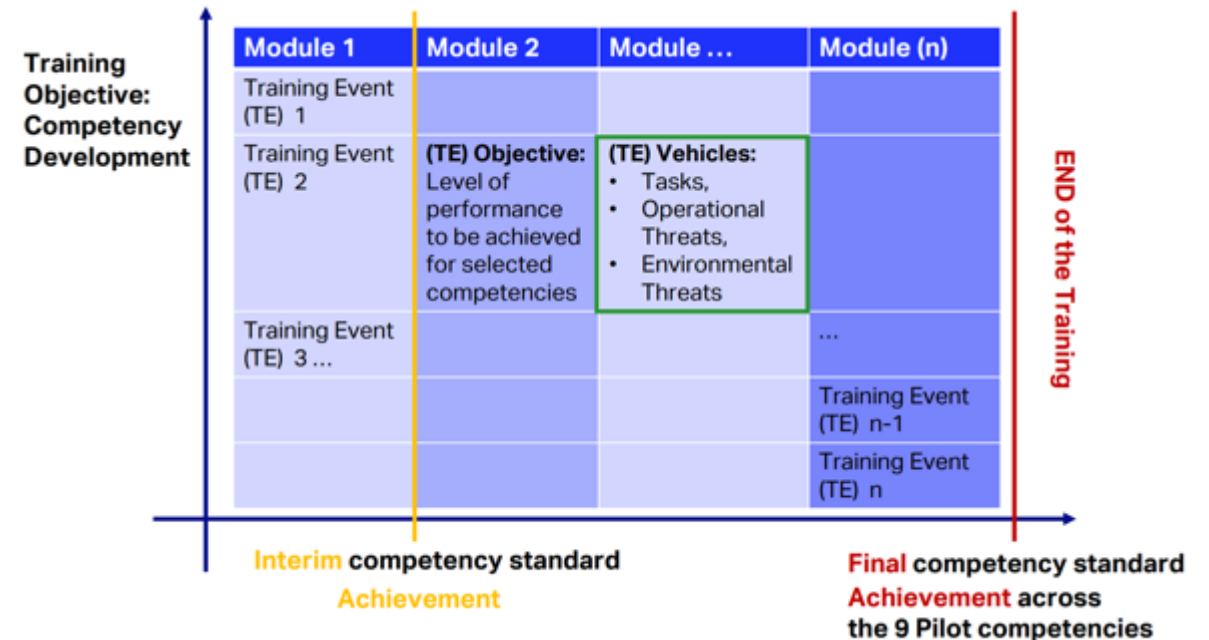**...To a Performance based Licensing system**

Opportunities

Global Safety Management enhancements by:

- **Providing more robustness to the licensing system (CE-6)**

The traditional approach:
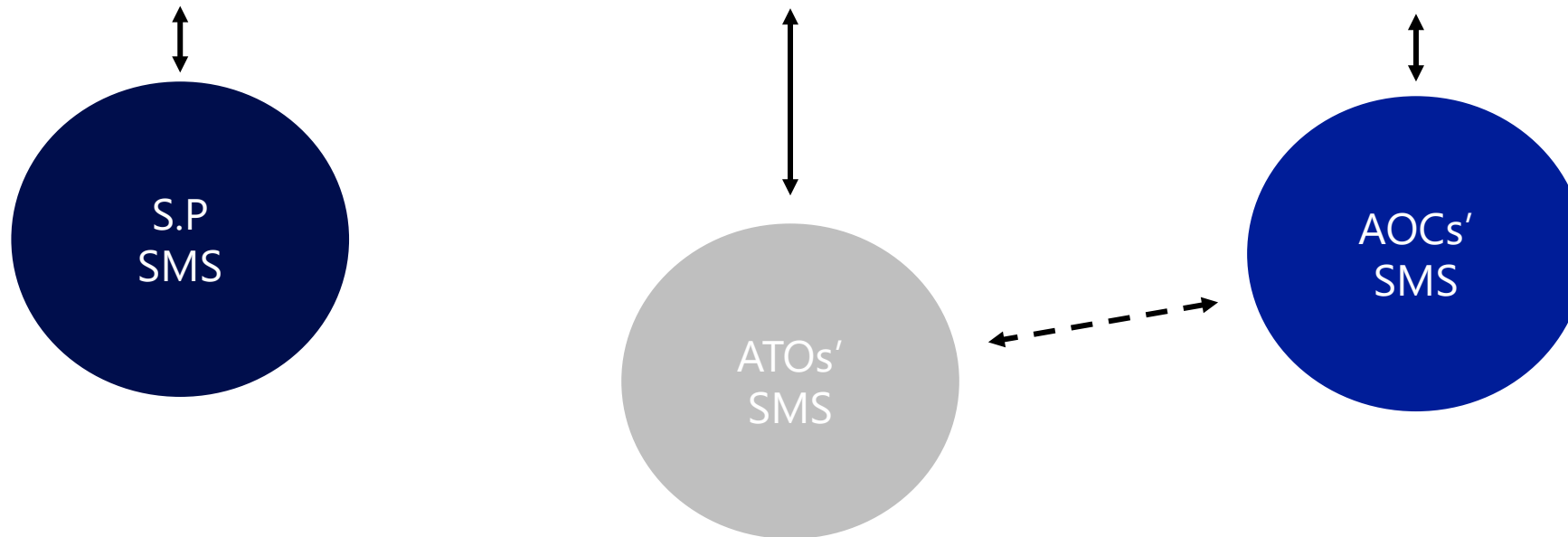
The CBTA approach:

Opportunities

Global Safety Management enhancements by:

- **Facilitating resolution of safety issues (CE-8)**

Means exchange of human performance data related to reduction of safety margins

↔

States-CAAs / State Safety Program (SSP)

S.P
SMS

ATOs'
SMS

AOCs'
SMS

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Challenge: Alignment of the Taxonomies

Safety Taxonomy	Training Taxonomy
Threats & Errors	Training topic
Undesired Aircraft State & End State	Reductions of Safety Margins
Flight Crew Countermeasures	Pilot & Instructor Competencies

Challenge: Training data protection

Challenge: Course Developer Qualification

Currently PANS TRG (ICAO Doc 9868): Status recommendation for States

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, (...)

2028 ICAO Annex: Status mandatory for States

10.5 Personnel

10.5.1   Course developers for competency-based training programmes shall have demonstrated that they are able to develop training in accordance with the principles of a competency-based approach to training, (...)

Challenge: license recognition

Problem Statement:
-Transition from the Proficiency world to the Competency world

Needs International harmonisation of the:

- Assessment process methodology.
- Minimum acceptable competency standard.
- Conditions under which the competency assessment takes place.
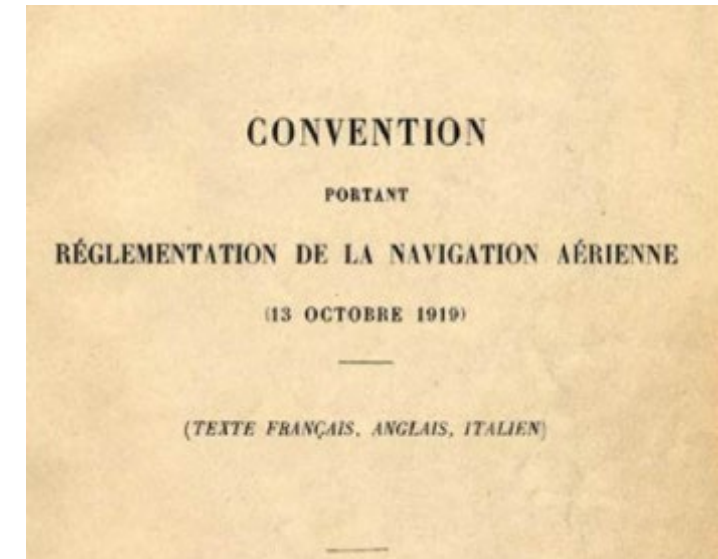- Qualification of the CAA's personnel due to CBTA oversight.

1944- Chicago convention

- **Article 32** *Licences du personnel*

- *a)* The pilot of every aircraft and the other members of the operating crew of every aircraft engaged in international navigation **shall be provided with certificates of competency and licenses** issued or rendered valid by the State in which the aircraft is registered.

- *b)* Each contracting State reserves the right to refuse to recognize, for the purpose of flight above its own territory, certificates of competency and licenses granted to any of its nationals by another contracting State.

- **Article 33** *Recognition of certificates and licences*

- Certificates of airworthiness and **certificates of competency and licenses** issued or rendered valid by the contracting State in which the aircraft is registered, **shall be recognized as valid by the other contracting States**, provided that the requirements under which such certificates or licenses were issued or rendered valid are equal to or above **the minimum standards which may be established** from time to time pursuant to this Convention.

Doc 7300/9

Convention on International Civil Aviation

Convention relative à l'aviation civile internationale

Convenio sobre Aviación Civil Internacional

Конвенция о международной гражданской авиации

This document supersedes Doc 7300/8.
Le présent document annule et remplace le Doc 7300/8.
Este documento reemplaza al Doc 7300/8.
Настоящий документ заменяет Doc 7300/8.

Ninth Edition – Neuvième édition – Novena edición – Издание девятое –– 2006

International Civil Aviation Organization
Organisation de l'aviation civile internationale
Organización de Aviación Civil Internacional
Международная организация гражданской авиации

1919- Paris convention

- **Article 12.** The commanding officer, pilots, engineers and other members of the operating crew of every aircraft shall, in accordance with the conditions laid down in Annex E, be provided with **certificates of competency and licenses issued** or rendered valid by the State whose nationality the aircraft possesses.

- **Article 13. Certificates** of airworthiness and **of competency and licenses issued** or rendered valid by the State whose nationality the aircraft possesses, in accordance with the regulations established by Annex B and Annex E and hereafter by the International Commission for Air Navigation, **shall be recognized as valid by the other States**. Each State has the right to refuse to recognize for the purpose of flights within the limits of and above its own territory certificates of competency and licenses granted to one of its nationals by another contracting State.

CONVENTION

PORTANT

RÉGLEMENTATION DE LA NAVIGATION AÉRIENNE

(13 OCTOBRE 1919)

(TEXTE FRANÇAIS, ANGLAIS, ITALIEN)

Thank you