PACDEFF 2017

Evidence-based Training (EBT)
Some lessons learned from Implementation

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EBT Foundation

The EBT Foundation

The Evidence-based Training (EBT) Foundation is a not-for-profit organisation based in Montreal

Comprises an international group of experts in the fields of airline training, flight operations and data analysis.

The Foundation works closely with airlines, manufacturers, training providers and regulators to help improve pilot training systems worldwide.

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Scope

➢ **Reminder – What is EBT all about?**

➢ **Some implementation lessons**

➢ **The future**

Issues

➢ Regulatory prescriptions for training and checking are based on events, <u>some of which are improbable</u> in aeroplanes designed to meet modern standards

➢ Recurrent training programmes are <u>saturated with items</u> that may not necessarily mitigate real risks, or enhance safety of modern air transport operations

➢ Actual events in modern aircraft indicate <u>new & different risks</u>

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EBT Working Group

EBT - Data Sources

CONVERGENCE

Training Criticality

Pilot Survey

Training Data AQP/ATQP

Accidents/Incidents

Flight Data

LOSA

n > 1,000

n > 3,000

n > 2,000,000

n > 9,000

"Black Swans"

➢ The majority of data are reactive
➢ Accidents are difficult to predict
➢ Pilot behaviour is difficult to predict

When people and complex systems interact, there will always be an infinite number of possible outcomes

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EBT - Objectives

Develop a new paradigm for competency based assessment and training of airline pilots based on evidence

Phase 1 Recurrent

Phase 2 Type Rating

ICAO Doc 9995 Manual of EBT
ICAO Doc 9868 PANS-TRG
EBT Implementation Guide
Data Report for EBT

Goal

Repetitive and foreseeable

What we know

Evidence

Operation

Systems

Environment

Unique and unforeseeable

What we don't know

No evidence

Develop **competence and confidence** *to manage foreseen and unforeseen events*

EBT Recurrent Training Phases

Phase	Evaluation	Manoeuvres Training *Validation	Scenario Based Training	In-seat Instruction
Objective	Assess competence Identify training needs	Train manoeuvre skills to proficiency	Develop resilience, learning by exposure	Error detection, monitoring, UPRT
Style	Line Oriented Evaluation	e.g. "V1 cut" All engine Go -around	Line oriented training	Non - assessable

*If required for Proficiency check

EBT Program Implementation

Baseline EBT Programme

- Off the shelf solution
- No analysis or design work by the operator required

Source: EBT Manual Appendices

Enhanced EBT Programme

- Data collection
- Aircraft type analysis
- Risk and training analysis
- Guidance development
- Program definition

Developed by the operator according the principles laid down in the EBT manual

Emerging Lessons

➢ **Engage with ALL Stakeholders**

➢ **Involve the regulator from start**

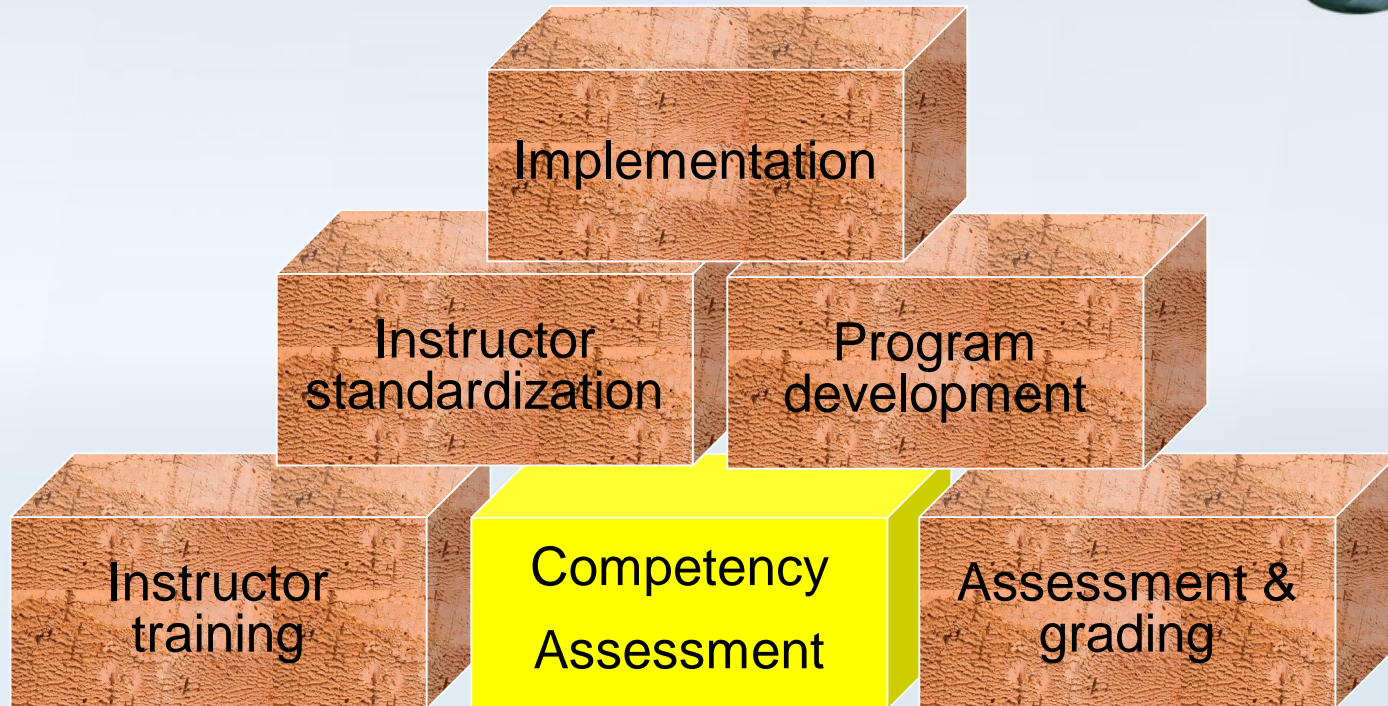➢ **Safety data ≠ Training data**

➢ **Start with a baseline program**

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Instructor Training

Sound Instructor Training and Calibration is ESSENTIAL for success

Steps to implementation

Implementation

Instructor standardization

Program development

Instructor training

Competency Assessment

Assessment & grading

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ICAO Competencies

Application of Procedures

Communication

Flight path management-automation

Flight path management-manual

Leadership & teamwork

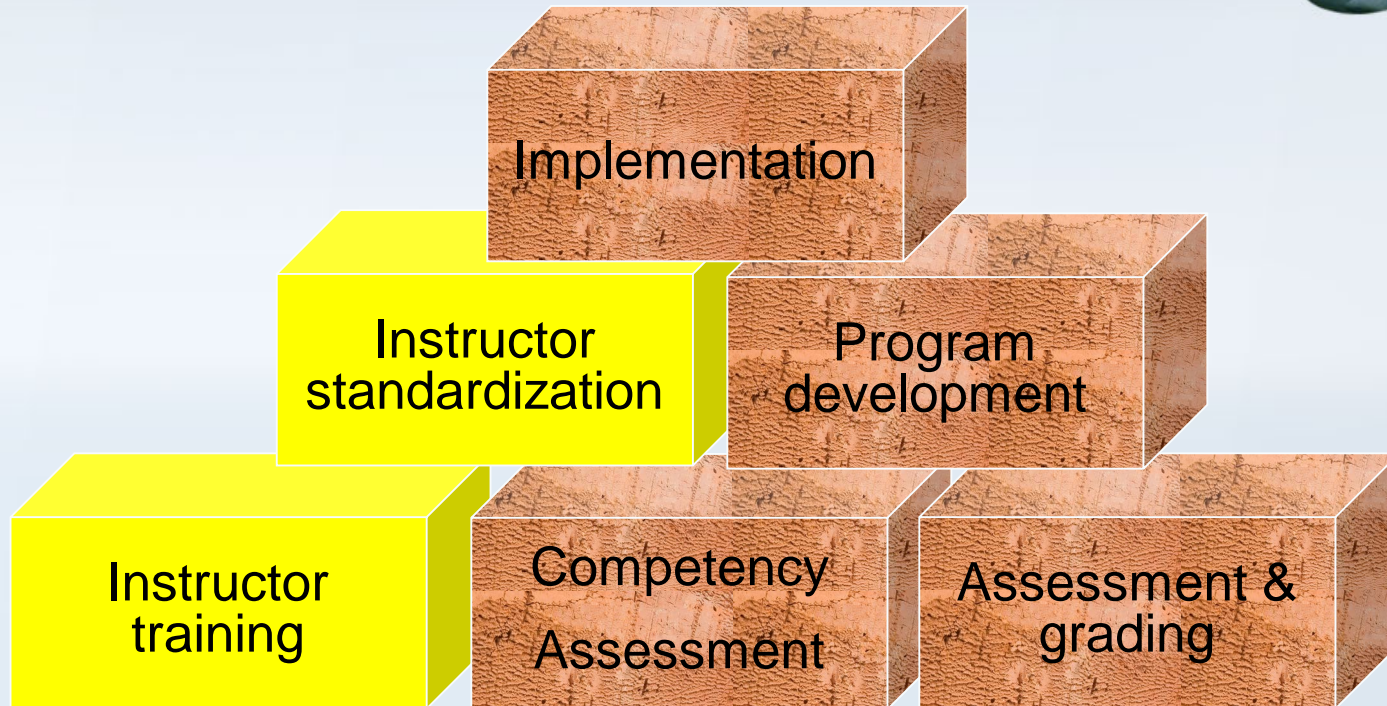**Problem solving & decision-making**

Situation awareness

Workload management

8 Areas of Competency
Underpinned by Knowledge

Steps to implementation

Implementation

Instructor standardization

Program development

Instructor training

Competency Assessment

Assessment & grading

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Instructor Training
Changes in paradigms

- Facilitation based on competencies
- Familiarity with competencies
- Behavioural Indicators
- Pilots learn by exposure
- "In – seat" instruction
- Inter-rater reliability
- Competency – centric
  <u>NOT</u> manoeuvre – centric
- Root cause analysis

Root Cause Analysis

Application of Procedures

Communication

Flight path management-automation

Flight path management-manual

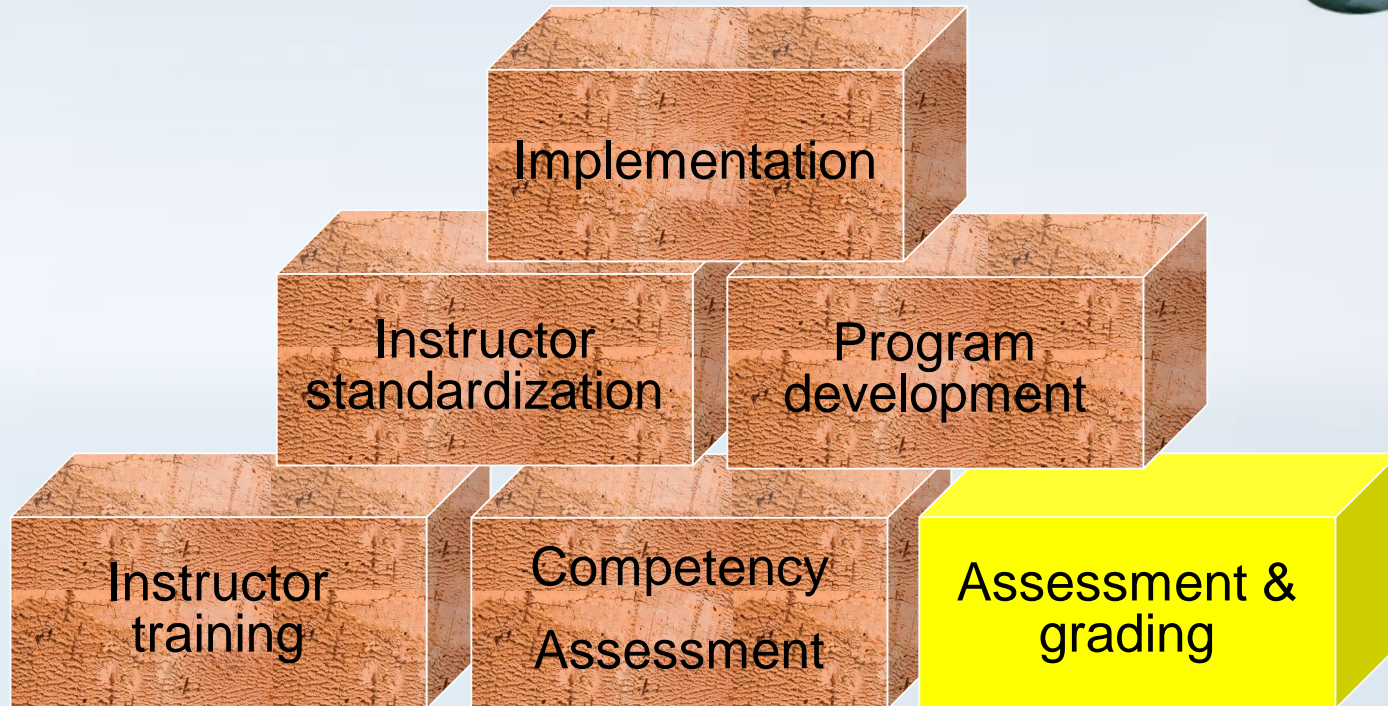**Leadership & teamwork**

Problem solving & decision-making

Situation awareness
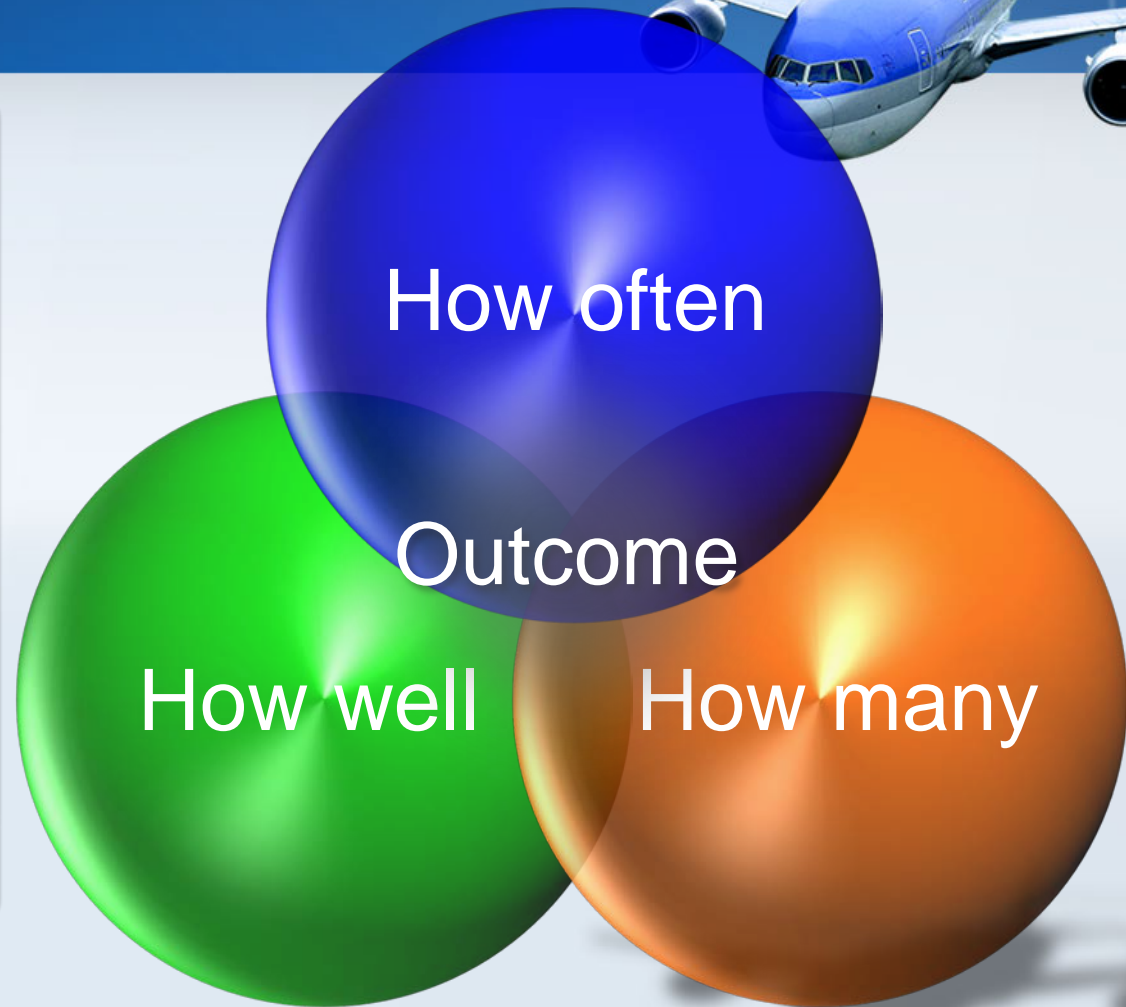
Workload management

8 Areas of Competency
Underpinned by Knowledge

Steps to implementation

Implementation

Instructor standardization

Program development

Instructor training

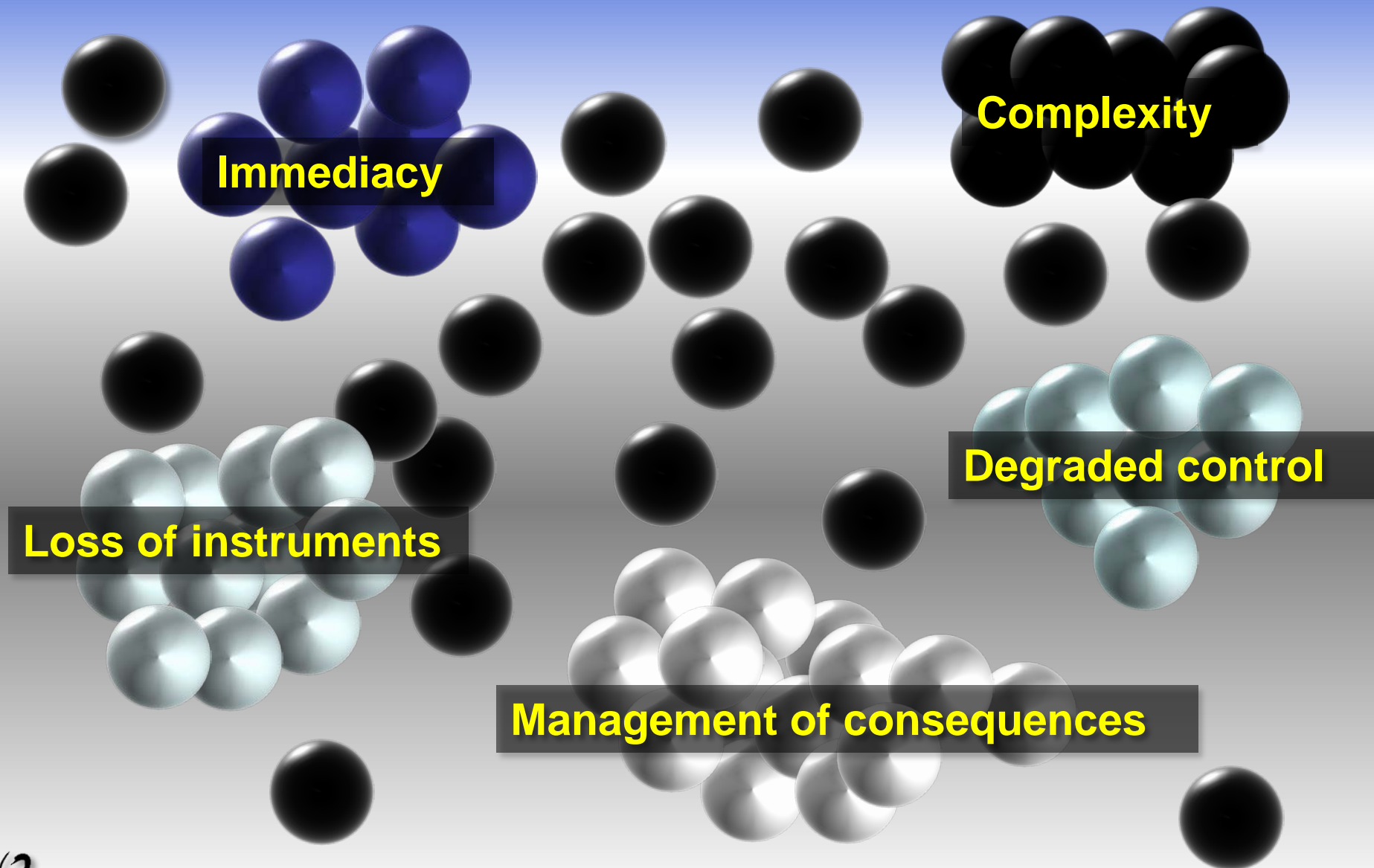Competency Assessment

Assessment & grading

'VENN' methodology

The pilot *managed* the workload in an exemplary manner, by *always* demonstrating *all* of the performance indicators when required, which *significantly enhanced safety* effectiveness and efficiency

How often

Outcome

How well

How many

Malfunction Clustering

Complexity

Immediacy

Degraded control

Loss of instruments

Management of consequences

EBT Status

ICAO Doc 9868 PANS-TRG Applicability 3rd May 2013

ICAO Doc 9995 Manual of EBT Applicability 3rd May 2013

IATA EBT Data Report July 2013

EBT Implementation Guide June 2013

AQP using an EBT framework

EASA EBT GM published December 2015

EASA RMT .0599 2016-2018 NPA 2017 (Baseline Recurrent)

NPA 2018 (Type Rating)

NPA 2019 (Helicopters)

EBT implementation

EBT reference material

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Future Training
Total systems approach

Operations Data:
FOQA; LOSA; ASR
Global Data:
EBT; LOSA; OEM events;

MPL Ab-Initio Program

Evidence Based Type Rating Program

Pilot Pre-selection

DE Pilot selection

Evidence Based Recurrent Training Program

Validation of system improvements

Output system training data

Continual program development

Determination of remediation in training, feedback to training system

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Thank you for your attention

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