

Evidence-based Training



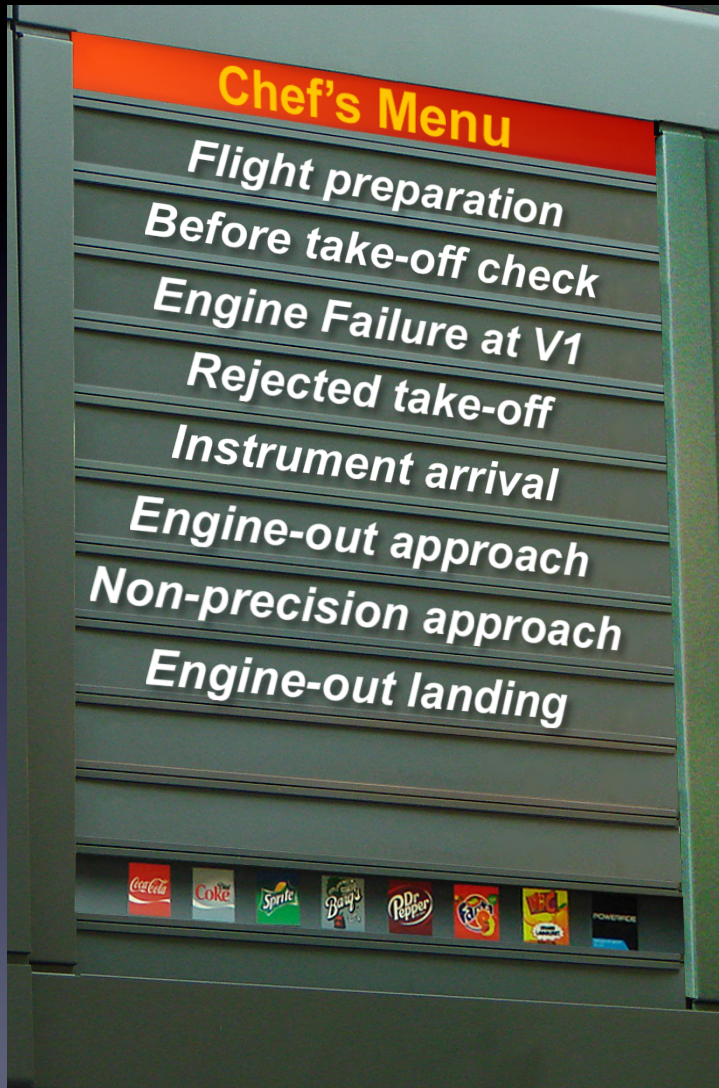
Today's menu?



Excellence



Today's menu



Does one-size fit all?



'Masterful Job'

plane intact — like it was sheared off," Quirin said in a telephone interview from his home. He runs Mellowdent

Braman said he was in a restaurant at the terminal and about a half-mile from the runway where the plane tried



failure" just lost an engine spokesman.

John Ley Federal Aviation hydraulic failure primary control surface engine airline

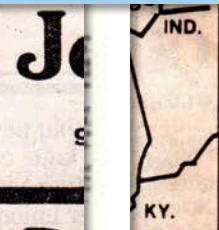
A plane's push its wings tends flaps wings and govt faces of the airplane on the wings and

er. He was inside the airport terminal at the time of the crash and said he saw a few survivors walk away from the crash, then make their way to telephones inside the terminal.

"Some of them were dirty and had bruises, but they did not look that bad," he said.

"Others were pretty badly burned. They were all badly shaken up and pretty much in shock."

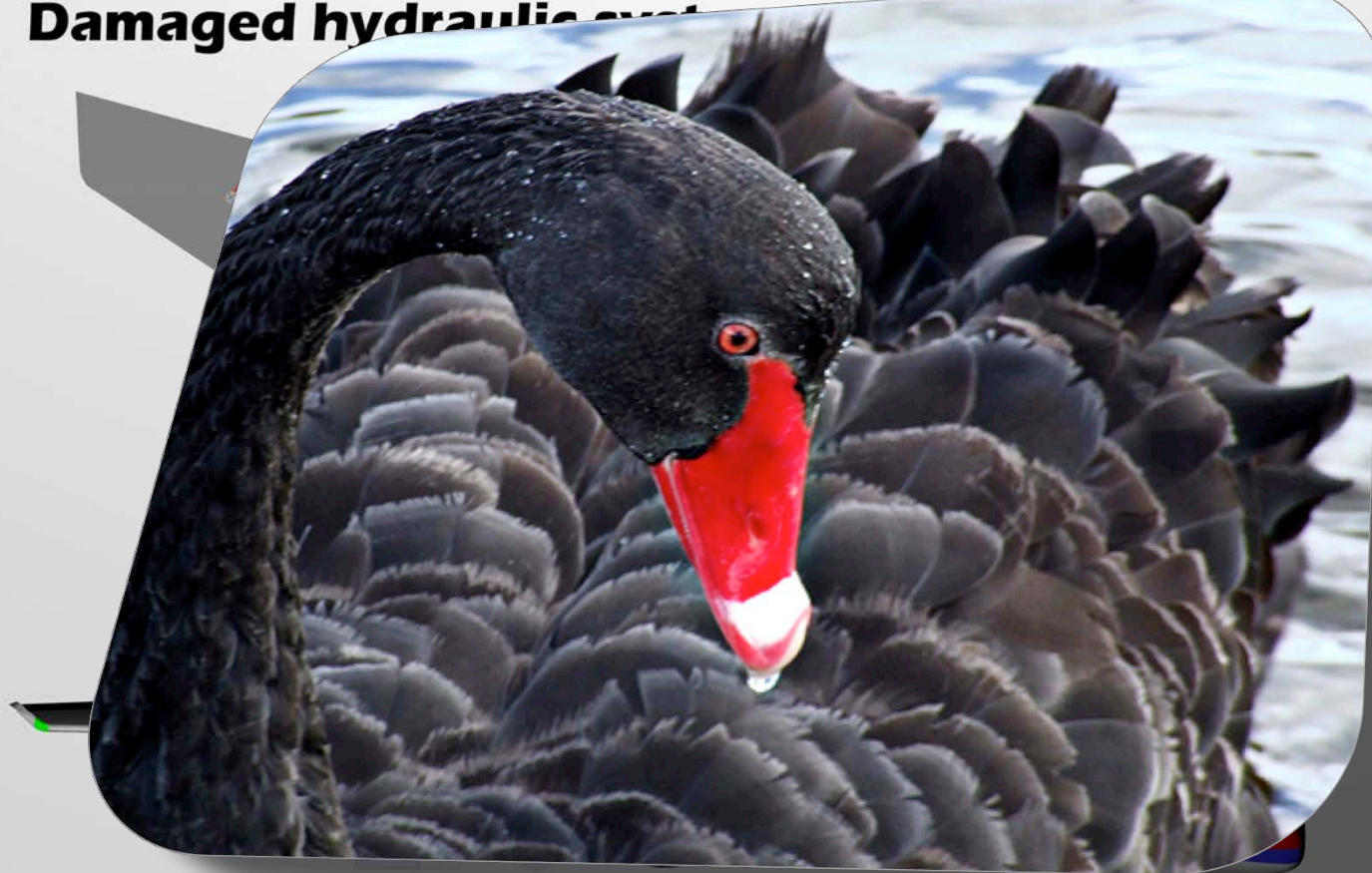
developing problems over Iowa.



3-D World-Herald
Sioux City after

UA 232

Damaged hydraulic system



Core competencies

Application of Procedures

Communication

Flight path management – automation

Flight path management – manual

Knowledge

Leadership & teamwork

Problem solving & decision-making

Situation awareness

Workload management



EBT Working group



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

1. ICAO Doc 9868 PANS-TRG
2. ICAO Doc 9995 Manual of EBT
3. EBT Implementation Guide
4. Data Report for EBT

Comparison by aircraft generation

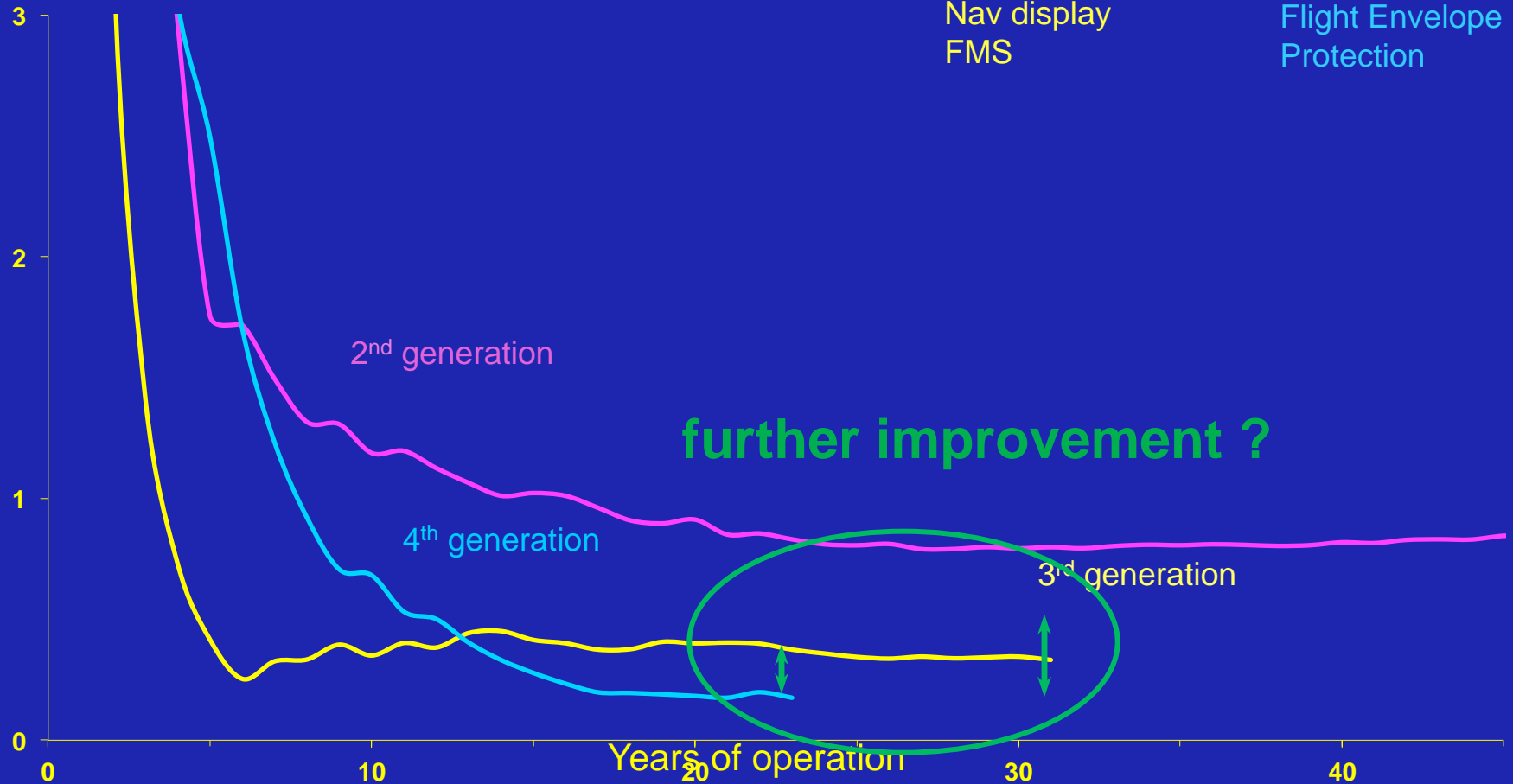
Fatal accident rate – 4Q 2011

Fatal accident per million departures

2nd generation:
2nd jet generation

3rd generation:
Glass-cockpit
Nav display
FMS

4th generation:
FBW
Flight Envelope
Protection



Sources: Ascend, Airbus

Evidence example

LOSA observer ratings for captain leadership and communication

TEM indicator: Average number per flight	Outstanding leadership and communication	Good leadership and poor communication	Poor leadership and communication
<i>Threats</i>	4.9	4.3	5.0
Mismanaged threats	0.3	0.7	1.1
Errors	2.3	5.6	7.0
Undesired aircraft states (UAS)	0.4	1.4	1.8



EBT – data analyses



Training topics-Gen3

Gen3 Jet Training Topics	A	Adverse weather	B	Adverse wind	C	ATC
		Automation management		Aircraft system malfunction		Engine failure
		Competencies non-technical (CRM)		Aircraft system management		Fire and smoke management
		Compliance		Approach, visibility close to minimum		Loss of communications
		Error management		Landing		Managing loading, fuel, performance errors
		Go-Around management		Surprise		Navigation
		Manual aircraft control		Windshear recovery		Operations or type specific
		Mismanaged aircraft state		Workload, distraction, pressure		Pilot incapacitation
		Monitoring & cross-checking				Runway or taxiway condition
		Unstable approach				Terrain
						Traffic
						Upset recovery

EBT Baseline Programme
ICAO Doc 9995

Training topics-Gen4

Gen4 Jet Training Topics	A	Adverse weather	B	Adverse wind	C	ATC
		Automation management		Aircraft system malfunction		Engine failure
		Competencies non-technical (CRM)		Aircraft System management		Fire and smoke management
		Compliance		Approach, visibility close to minimum		Loss of communications
		Error management		Landing		Managing loading, fuel, performance errors
		Go-Around management		Runway or taxiway condition		Navigation
		Manual aircraft control		Surprise		Operations or type specific
		Mismanaged aircraft state		Terrain		Pilot incapacitation
		Monitoring & cross-checking		Workload, distraction, pressure		Traffic
		Unstable approach				Upset recovery
						Windshear recovery

EBT Baseline Programme
ICAO Doc 9995

Competency development



Session 1

- ✓ Task/condition/standard
- ✓ Task/condition/standard
- ✓ Task/condition/standard
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- ✓ Task/condition/standard
- ✓ Task/condition/standard

Session 2

Session 3

Session 4

Session 5

Session 6

Tasks

Competencies tool shop



66 Performance indicators

Instructors

Aggressive, abusive and intimidating

Superior, arrogant and know it all

Don't listen and talk too much

Cannot observe objectively

Do not have an open mind

Leave student guessing



Instructors

Manage Safety
Prepare the Training Environment
Manage the Trainee
Conduct Training
Perform assessment
Perform course evaluation
Continuously improve performance
ICAO Doc 9868 Ch6

Patient and has a positive attitude

Shows humility and admits mistakes

Encourages and is honest

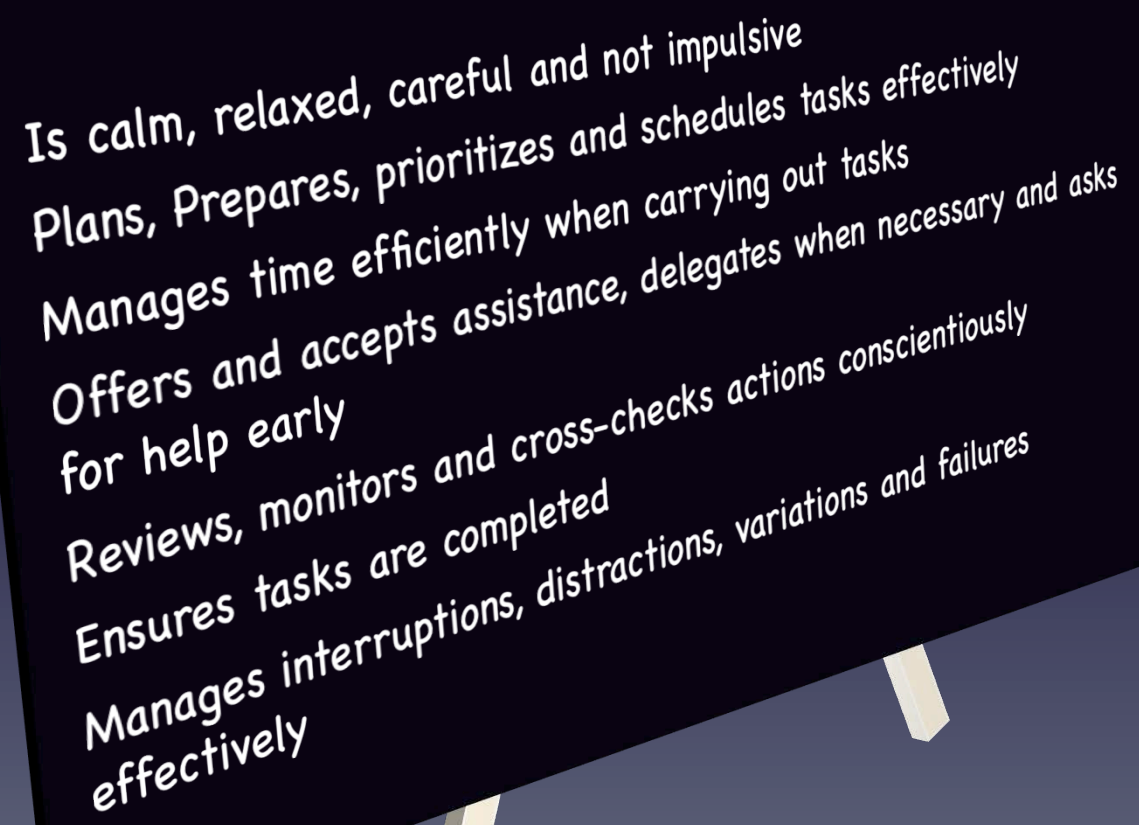
Non-judgmental and shows empathy

Supportive, respectful and honest

Good knowledge

Example performance indicators

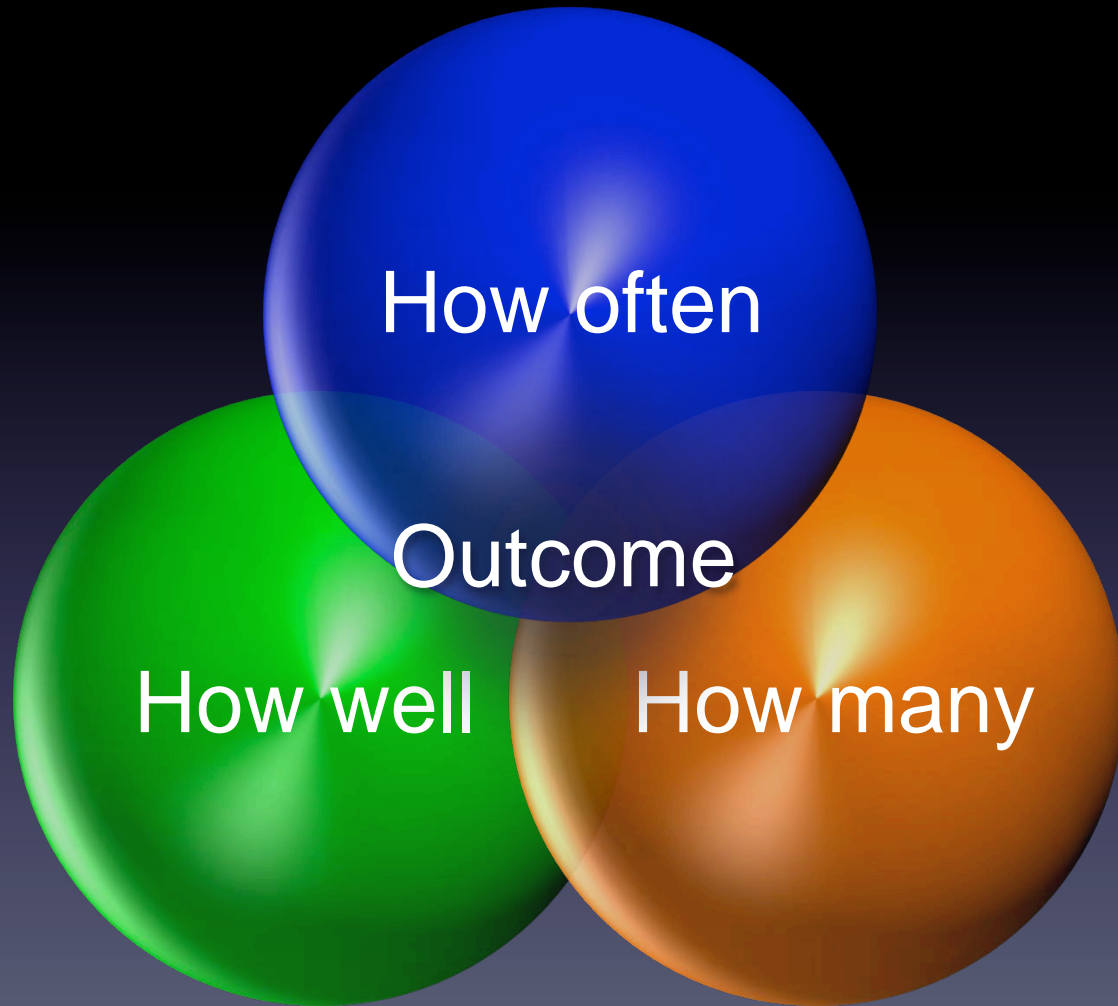
Example Workload Management



Is calm, relaxed, careful and not impulsive
Plans, Prepares, 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 cross-checks actions conscientiously
Ensures tasks are completed
Manages interruptions, distractions, variations and failures effectively

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



Doc 9868



Procedures for
Air Navigation Services

Training

Doc 9866
AM/497



**Manual of
Evidence-based Training**



**Evidence-Based Training
Implementation Guide**
May 2013

1st Edition



**Data Report for
Evidence-Based Training**
July 2013

1st Edition

New references for EBT
Applicability 3rd May 2013

EBT – Current 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
- ✓ FAA Endorse transition from AQP

EASA SIB Q1 2015

EASA Rulemaking task 2015

CAAC CCAR 121 R4

EBT Implementation



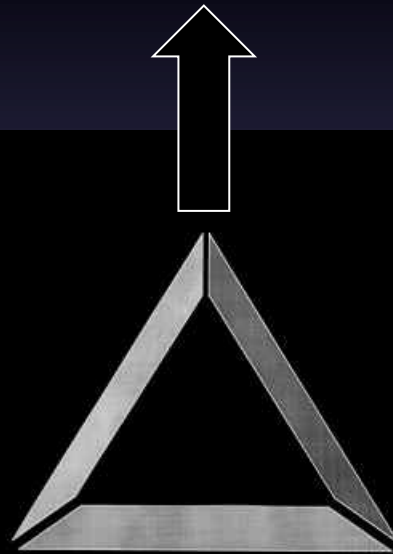
EBT Training Phases

	Evaluation	Manoeuvres Training	Scenario Based Training
Objective	Assess competence Identify training needs	Train manoeuvre skills to proficiency	Develop resilience, learning by exposure
Conduct	Line Orientated Evaluation	e.g. "V1 cut" All engine Go - around (New)	Line orientated training

EBT characteristics

Enhanced

Baseline



EBT characteristics

Approach type
clustering

Malfunction clustering

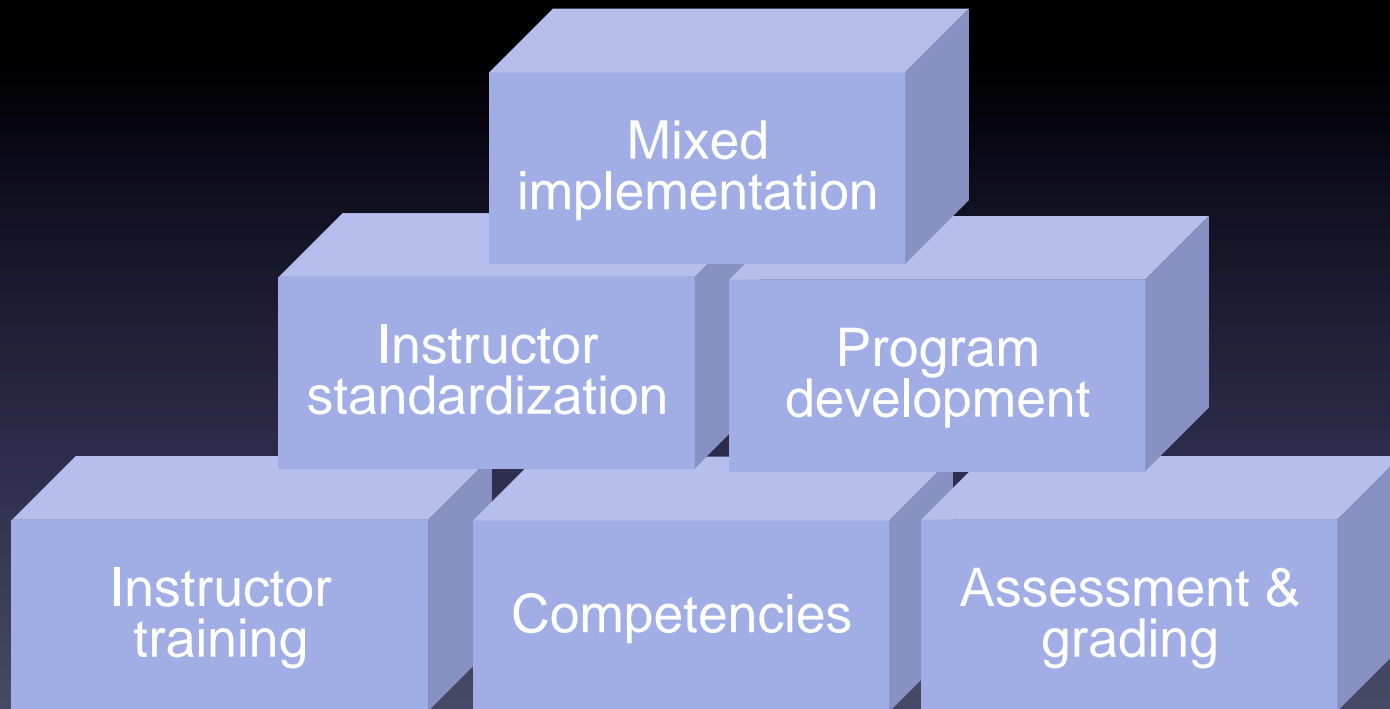
Surprise

In-seat instruction

Malfunction clustering



Steps to implementation



Bill Voss (2013)

President Flight Safety Foundation

“In a breakthrough that I would not have expected for years, the International Civil Aviation Organization (ICAO) has approved provisions for evidence-based training (EBT) in ICAO Standards and Recommended Practices...”



“Credit goes to some extraordinary work done by a range of people and organizations that came together faster and better than anyone expected...”

Summary

*Failures are less likely with modern,
reliable technology ...*

*When humans and technology interact,
there are a huge number of possible
outcomes ...*

*Develop resilience to events through
exposure ...*

Summary

Learn from the
positive

Measure
performance
effectively

Learning
through
exposure

Continually
examine the
evidence

Reinforce
Key learning

Resilience



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