IATA Training & Qualification Initiative (ITQI)

Evidence-Based Training

Captain Mike Varney
Project Leader – Evidence-based Training

ICAO NGAP Symposium 1-4 March 2010, Montreal
Dakota DC-3 Rand Airport South Africa 2003
Ilyushin IL-18 Moscow 2005
Sud SE-210 Caravelle III Zurich July 1961
Continental Airlines Boeing 757-200 August 2005
Airbus A380
Boeing 787
Does one size fit All?
JAR-FCL Mandatory Items

- Flight Preparation
- Before take-off checklist
- Engine failure between V1 and V2
- Rejected take-off before reaching V1
- Instrument departure and arrival procedures
- Engine-out Precision Approach to minima
- NDB/VOR/LOC approach to MDA Outlook
- Go-Around engine-out
- Landing critical engine inoperative
The Airline Burden
Crowding of training requirements

- Existing framework
  - Mandatory items – licensing and operations
  - Low Visibility mandatory items
  - Special airport operations
  - ETOPS, RNP SAAAR, RNAV

- Very little scope for effective additional training within existing cost structure

- Too much focus on abnormal procedures

- Much more needed in approach & landing
The Problem

➤ Regulatory prescriptions for flight crewmember training and checking are based on events, which may be highly improbable in aeroplanes designed to meet modern standards.

➤ Training programmes are consequently saturated with items that may not necessarily mitigate the real risks, or enhance the safety of modern air transport operations.
Objective

Develop a new paradigm for competency based training and evaluation of airline pilots based on evidence
Working Group
Flight Operations Areas

Evidence-based Type-Rating and Recurrent Training (EBT)  Q3 2011
- ICAO Doc 9868 + ICAO Manual EBT

Multi-Crew Pilot licensing (MPL)  Q4 2010
- Harmonisation of implementation

Instructor & Evaluator Qualification (IEQ)  Q3 2011
- ICAO Doc 9868 Qualification standards

Selection Criteria  Q2 2010
- IATA guidance material

Flight Simulator Training Devices (FSTD)  Aug 2009
- ICAO Doc 9625 + Data document
Hull Loss rate – June 2009

Sources: Airclaims, Airbus

1st generation: 2nd generation: 3rd generation: 4th generation:
Early jet 2nd jet generation Glass-cockpit
2nd generation: Nav display FBW
3rd generation: FMS Flight Envelope
4th generation: Protection

Includes western built jets
Excludes training, flight test, war, terrorism
Relative Importance of contributing factors in fatal accidents

(Source: Civil Aviation Safety Data, 1989-2003)
STEADES

Top 20 FLT OPS ASRs

- Flight/Ground Crew Comms
- Approach/Landing Aids
- Hard/Heavy Landing
- Flight Plan
- Other Operational Data
- Operational Procedures
- Severe Weather
- Flight Crew Fatigue/Stress
- Insufficient Visual Reference
- Tailwind
- Comms with ATC Lost
- Flight Crew Manual Handling
- Checklist/SOP Use
- Inadequate Separation
- Windshear
- Other Aircraft - Slow to Clear Runway
- Flight Crew Mis-Selection
- Turbulence
- High Energy/Unstable Approach
- Aircraft Limit Exceedence
Max vertical acceleration and vertical speed (at touchdown)

- A340-300
- A340-600

![Graph of vertical acceleration vs. vertical speed](image)
Max vertical acceleration and vertical speed (at touchdown)

A340-300
A340-600
Data can mislead

- Should we train for the statistically likely?
- We can anticipate 95% of events
- The BIG problem is the other 5%
Black Swans

- Data is 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*
The Unforeseen, a “typical” Black Swan!
If we could anticipate all, failures should be designed out (Sioux City)
Repetitive & foreseeable

Unique & unforeseeable

Evidence

What we know

Reactive

Operational failures

System failures

Environment

Operational failures

System failures

Environment

Proactive

Same skills to manage the foreseen and the unforeseen
EBT Development Process

- Jet 1st
- Jet 2nd
- Jet 3rd
- Jet 4th
- Turboprop 1st
- Turboprop 2nd

- LOE
- Manoeuvres
- Event Training
- Evaluator
- Instructor
ICAO Doc 9868 PANS-TRG

- Evidence Based Training
- Instructor Qualification
- Evaluator Qualification

ICAO Manual – EBT

- Comprehensive
- Includes Example Programs
- Link to available data
KSA Elements

- Situation awareness
- Communication
- Manual aircraft control
- Workload management
- Flight management, guidance and automation
- Knowledge
- Application of procedures and knowledge
- Problem solving & decision making
- Leadership & teamwork
Emirates - GCAA

- Dubai Meetings 15th -16th Nov 2009
  - Emirates – Airbus – Boeing – IATA
  - Preliminary Discussions
  - Emirates – GCAA – Airbus – Boeing
- Joint Letter to GCAA EK+IATA
- GCAA Agreement 21st Dec 2009
- EK adopt EBT – EU OPS 1.978 (ATQP)
- Airbus, Boeing, IATA support
Risk of doing nothing

Figure 8: Worldwide fatality rate (per million hours) by class of aircraft
Benefits

- Evidence based programmes adapted by fleet and operation
- Greater focus on normal operations
- Greater emphasis on human performance
- Encourage “out of the box” thinking with developed methodologies to manage risk

*Figure 1* Worldwide reportable accidents involving large transport aircraft
Improvements in design & reliability

Examine the Evidence

Evolve training from inventory approach

New Paradigm for Training

Train real skills to manage real threats
Thank you
itqi@iata.org

to represent, lead and serve the airline industry