



Continuous Pilot Training, Urgencies and Realities (What are we waiting for?)

**ICAO Next Generation Of Aviation
Professionals Symposium**

March 1-4, 2010

Introductions

Captain Jean-Michel Bigarré

CEO & President

ETOPS Aviation Services

A division of MWC



Mark Dransfield

**Senior Director Business
Development & Strategy**

Mechtronix Systems

A division of MWC



Context – What's being reported?

Flight International Editorial 21-27 July 2009

Global airline safety has stopped improving for the first time in aviation's history....

*It is not possible to come up with a single reason why improvement has stalled.....All of them (accidents) demonstrate **flaws in pilot recurrent training.***

Flight Safety Foundation, July 2009

- *"If we continue at this pace, we'll be turning the clock back 10 years in safety," said Bill Voss, President Flight Safety Foundation*

UK CAA Global Airline Safety Analysis 2009 :

- Crew-related issues dominate accident causal factors, featuring in 75% of fatal accidents



Flight International 14th September 2009 edition

(Asia Pacific Aviation Training Symposium)

- Major Regulators urged to **rethink full-flight simulator training requirements**
- Flight training executives are calling for certification authorities to rethink their regulations to allow the industry to **reduce its dependence on highly expensive full-flight simulators in favour of cheaper alternative devices.**

Flight International Editorial

23 – 28 February 2010

Pilot handling was a contributory factor in 30% of airline accidents globally in 2009, according to the International Air Transport Association analysis of accident rates for the period. ..

*...It is pressing industry to embrace its IATA Training and Qualification Initiative, which it describes as "a push for **harmonising a competency-based approach to training real skills**", rather than just airline compliance with the minimum regulatory requirements for pilots to gain and maintain a pilot licence.*

Questions to be answered

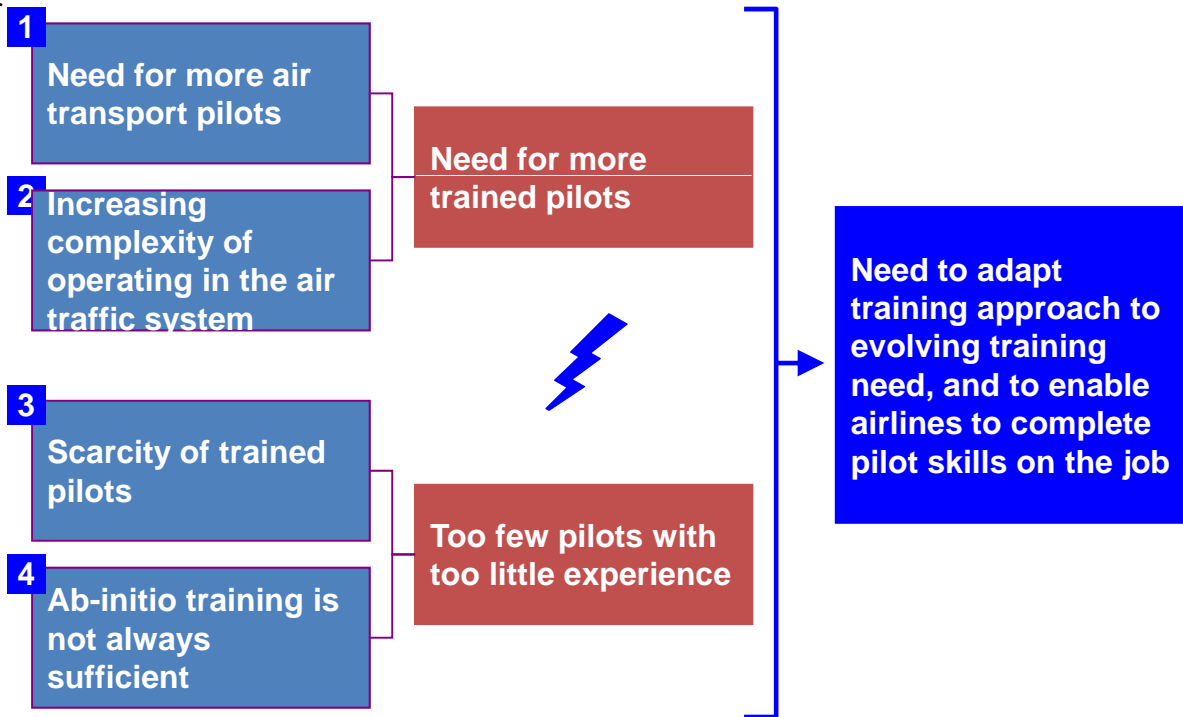


- 1) **Challenges for Airlines and pilot training**
- 2) **Industry initiatives that are reviewing..**
 - **Pilot ab-initio and recurrent training methods**
 - **Flight Simulation Training Device (FSTD) requirements**
- 3) **Technological advances in FSTDs**
- 4) **How do 2) and 3) above address the Challenges in 1)**

1) CHALLENGES FOR AIRLINES AND PILOT TRAINING

Numerous challenges are calling today for a review of the training programs designed by airlines with their authorities

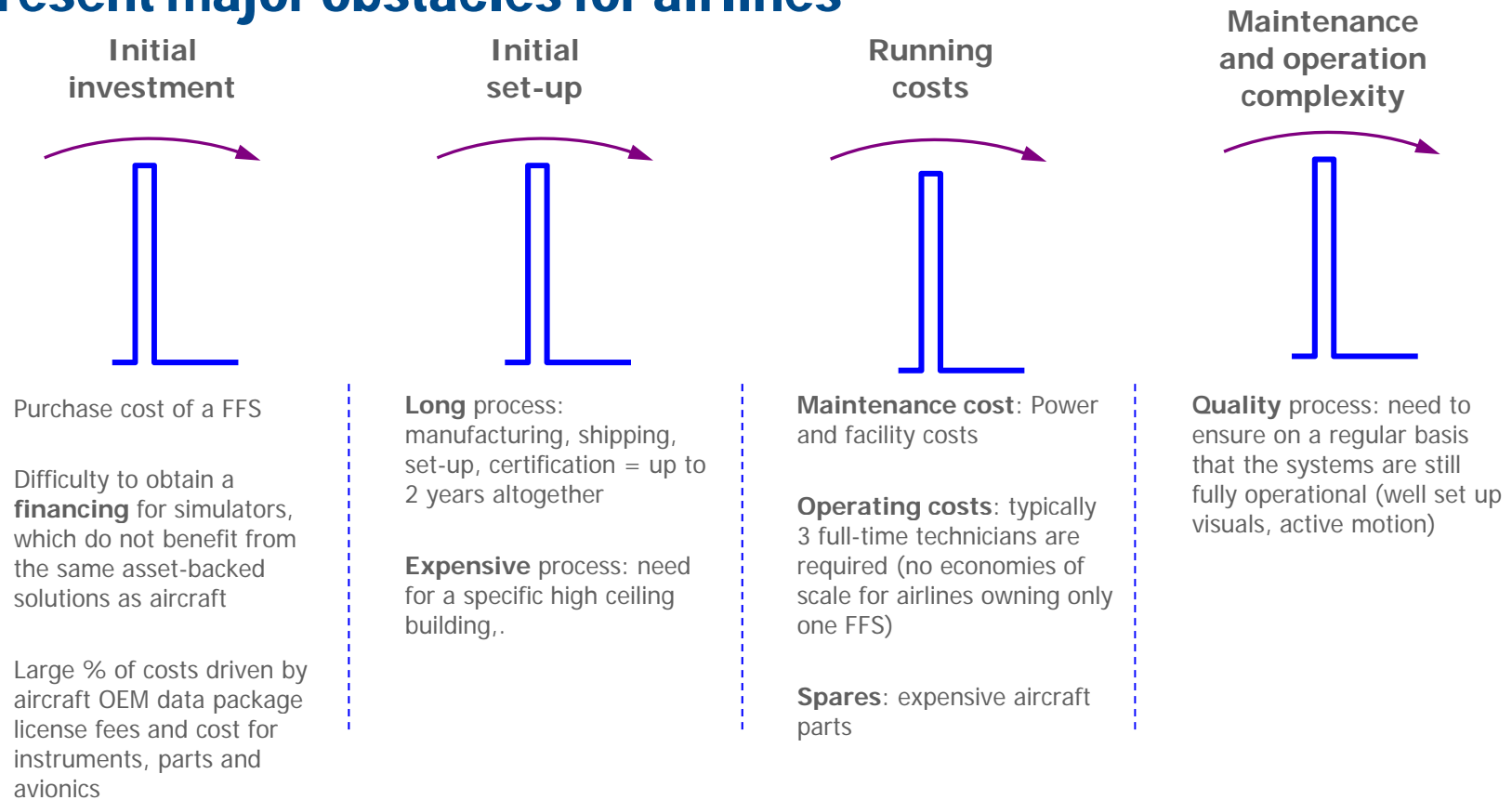
- World air traffic to grow by 20% per year worldwide by 2025
- World commercial fleet to reach 35000 a/c by 2025 (from 17000 today)
- Increasing sophistication of cockpits
- Increasing airspace congestion
- Lack of ab initio schools
- Annual need of 18 000 pilots (commercial, business jet, cargo)
- High pilot turnover / poaching
- "We cannot be as selective as we used to be" [Chief Pilot, Asian airline]



Source: Roland Berger analysis

1) CHALLENGES FOR AIRLINES AND PILOT TRAINING

The costs and complexity of a classical FFS can sometimes represent major obstacles for airlines



Required utilization rate to be economically viable: ~ 3000 hours per year
(corresponds to a fleet of 20 large commercial aircraft of the same type,
whereas most Tier-2s and Tier-3s¹) operate fleets of 5 to 20 LCA or 5 to 30 regional jets and turboprops)

1) CHALLENGES FOR AIRLINES AND PILOT TRAINING

The use of remote third-party training centers is a source of significant direct and indirect costs

"Every year, I spend USD 20 000 per pilot on recurrent training, and that is not even enough to acquire all the necessary skills"
[Chief Pilot, Asia-Pacific]

Example of costs incurred by an average European airline for 1 OPC for 1 crew

Direct costs	Simulator time	<ul style="list-style-type: none"> \$ 4 000 for FFS dry rental¹⁾
	Trans- portation	<ul style="list-style-type: none"> \$1 000 (for airlines not operating flights to the centre):
	Accommodation	<ul style="list-style-type: none"> \$ 1000 for hotel and per diem allowance for two pilots over 2 nights The idle away crew needs to be replaced for flying operations <ul style="list-style-type: none"> Europe airline: 2 days²⁾ of flying missed for 4 hours of FFS Latam airline: 3 days flying missed for 4 hours of FFS Additional cost of the instructor (SFI, TRI, TRE), away from operations as well during the training sessions
Indirect costs	"Away cost" of trainees	<ul style="list-style-type: none"> Additional cost of the instructor (SFI, TRI, TRE), away from operations as well during the training sessions
	"Inflexibility" cost	<ul style="list-style-type: none"> Slots are difficult to reschedule <ul style="list-style-type: none"> when a crew misses the slot when a crew fails the training when the FFS is down

Case study: Tier-3 airline in the South Pacific

- Closest FFS for aircraft type located in **Bangkok**
- Overall time required for 4 hours of simulator in Bangkok: **4 to 5 days** (incl. rest)
- Consequence: the national authority allows both recurrent training and checking to be conducted on the **aircraft** for the fleet
- A device based at home base will significantly improve the quality of training, hence the **safety** of the airline

1) Average based on European Tier-2 airlines' feedback

2) training + travel + briefing/debriefing + rest

Source: Interviews, Roland Berger analysis

2) INDUSTRY INITIATIVES

**INCREASE TRAINING = USE MORE SIMULATION
= BUT DO NOT INCREASE COST**

- **Pilot ab-initio and recurrent training methods**

- **ICAO MPL** (ref Dieter Harms presentation)
- **IATA ITQI** (ref Mike Varney presentation)

Developing global standards and best practices for (amongst others):

- *MPL implementation*
- *Type Rating and Recurrent training*
- *Transition into Competency based training*

- **Flight Simulation Training Device (FSTD) requirements**

- **Royal Aeronautical Society International Working Group (IWG)**

- *Harmonization of FSTD Requirements – a global standard*



2) INDUSTRY INITIATIVES

Royal Aeronautical Society International Working Group



- A \$10m industry effort to harmonize the technical requirements for FSTDs and how they might be used in flight crew member training based on a detailed training task analysis

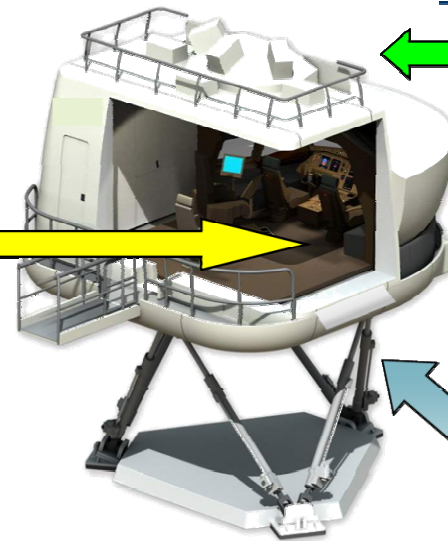
➤Analysed all the training tasks required to be performed from EASA/ICAO/FAA training task lists

MPL1,2,3,4	Multi-crew Pilot License
IR	Initial Instrument Rating
PPL	Private Pilots License
CPL	Commercial Pilots License
CR	Class Rating
TR	Type Rating
RL	Recurrent License (Training & Checking)
RO	Recurrent Operator (Training & Checking)
Re	Recency (Take-off and Landing)
CQ	Continuing Qualification
IO	Initial Operator

Agreed list of simulation features elements required to support any individual training task

Aircraft Simulation

- Flight Model – Aero & Engine
- Aircraft Systems
- Ground Handling
- Flight Controls & Forces
- Cockpit layout



Environment Simulation

- Environment ATC
- Environment Weather
- Environment Navigation
- Environment Aerodrome & Terrain

Cueing Simulation

- Sound Cue
- Visual Cue
- Motion Cue

ICAO 9625 Edition 3

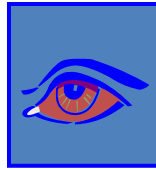
- Provides a means to evaluate any age/type of FSTD **based on training task analysis**, not technology standards

3) FSTD TECHNOLOGY ADVANCES

The new-generation fixed based simulators use state of the art technology to provide an excellent training experience

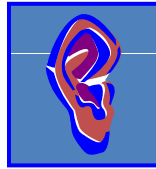
Cueing

Sending stimuli to the pilots' brain to recreate sensations for pedagogical purposes, rather than imitate the aircraft



Visual cues

- Collimated display recreating the visual environment of a pilot (moves of the aircraft conveyed to the pilot through the visual moves)
- Full replication of the systems for complete review of the pilot's visual path



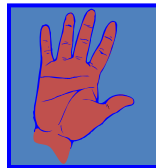
Sound cues

- High-fidelity sound system
 - To replicate the sound interfaces of the avionics systems
 - To recreate an environment of noise stress



Smelling cues

- Smoke generator to announce important mechanical failures



Proprioceptive / motion cues

- Force feedback based on the aircraft data loop
- Seat with integrated motion (3 axis acceleration) and vibrations to generate pilot reactions (e.g. in case of touch-down, landing gear extraction...)

3) FSTD TECHNOLOGY ADVANCES

High Performance fixed - base simulators now closer to traditional Full Flight Simulators

Numerous NAAs across the globe have already individually granted their airlines the authorization to use the new generation fixed-based simulators for recurrent training



	Training	Ops Check
France	√	√
Oman	√	√
Fiji	√	√
Brazil	√	√
Italy	√	
Poland	√	
Czech Rep.	√	
Russia	√	
United Kingdom	√	√
Venezuela	√	

BACKING OF THE NAAs

Slide 11

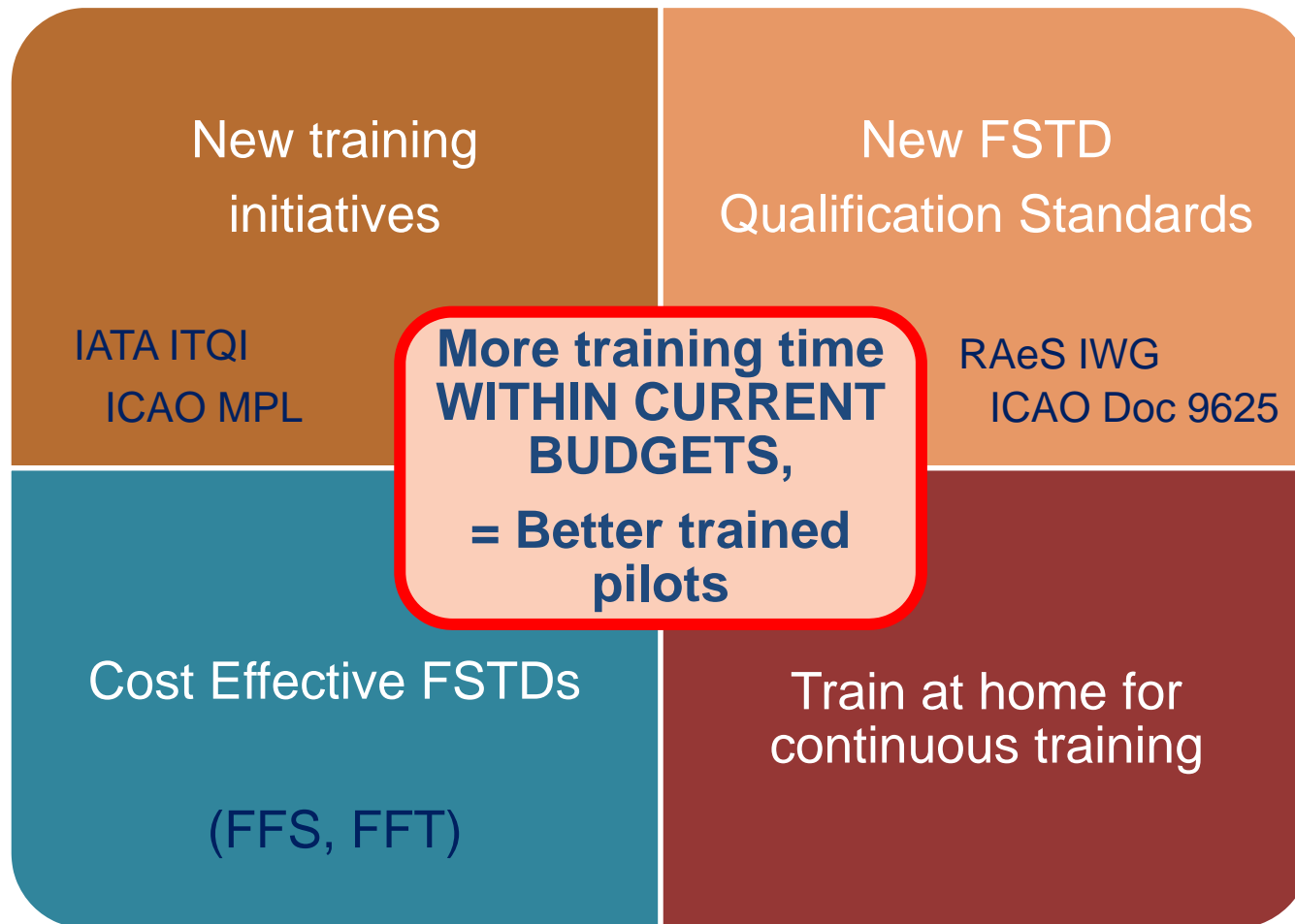
XH1

Propio vs control loading as per FFS

UK and otehr up[dated on OPS checks
Xavier Hervé, 1/03/10

4) ADDRESSING THE CHALLENGES

– Put the pieces of the jigsaw together...



4) ADDRESSING THE CHALLENGES - A NEW SOLUTION FOR A NEW SITUATION

The evolution of the airline landscape, which is calling for a new approach to continuous training, in order to improve global safety

A

Most airlines today are facing a conjunction of challenges to the skill level of their pilots

- Increasing number of aircraft to be flown
- Increasing complexity of operating aircraft systems
- Increasing congestion of air traffic
- Scarcity of trained pilots leading to a high turnover
- Lack of entry-level skills and pilot experience

Need to compensate the initial shortcomings through more [continuous] training

B

Against these challenges, the classical approach to simulator training presents certain airlines with considerable drawbacks and heavy costs

- Cost pressure on Tier-2 and Tier-3 operators
- Unfavourable economics of classic simulation and third-party training
- Remoteness of the training centres

Need for an alternative solution that would make economic sense for more airlines to conduct continuous training at home

C

Under the approval of national authorities, one new way of training has been devised and tested to address this need, with high-performance fixed-based simulators installed at the airline home base

- High performance training tool
- Backing from numerous NAAs
- Optimized cost and maintenance
- Continuous training at home: more, deeper and customized

Need to give the national authorities sufficient flexibility to enable continuous training at home

Thank you

