ADVANCING FTD TECHNOLOGIES AND THE OPPORTUNITY TO THE PILOT TRAINING JOURNEY

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AVIATION TRAINING INNOVATION

Over the past decade the airline training industry has pursued technology to improve efficiencies and enhance training
- Shift training earlier in the training continuum
- Allow students to better learn at their own pace, with options to use simulation

Regulatory authorities have been willing to explore use of such technology, techniques and capabilities

Although there has been substantial innovation, opportunities exist
EXAMPLE TYPE RATING

PAST TRAINING JOURNEY

1

GROUND SCHOOL

- Classroom based instruction
- FMS Simulation
- Review of Flow Patterns
- Systems Integration Training

2

FLIGHT TRAINING

- Static Briefing
- Full Flight Simulator

#313-360 FLIGHT INSTRUMENTS

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EXAMPLE TYPE RATING
CURRENT TRAINING JOURNEY

1. SYSTEMS KNOWLEDGE
   - Computer Based Training Tools
   - Comprehensive Aircraft Simulation

2. PROCEDURE TRAINING
   - Procedure Training Lessons and Tools
   - Flat Panel Device

3. FLIGHT TRAINING
   - Briefing / Debriefing Station
   - Full Flight Simulator

LEARNING MANAGEMENT SYSTEM
TOTAL TRAINING SOLUTION TYPE RATING PROGRAM

UTILIZING L3 CTS PRODUCTS

SYSTEMS KNOWLEDGE

Mobile Applications

PROCEDURE TRAINING

Flat Panel Devices

MANEUVERS VALIDATION

FFS

LINE ORIENTATED SCENARIOS

FFS

LOE / CHECKRIDE

FFS
Although there has been substantial innovation, opportunities exist…

**Traditional Type Rating Curriculum**
- Ground Instructor Guided Training
- Flight Simulator (Non-Motion)
- Full Flight Simulator (Motion)

**Current Type Rating Curriculum**
- Ground Instructor Guided Training
- Computer Based Training
- Lower Level Device
- Full Flight Simulator (Motion)

**Future Type Rating Curriculum**
- Ground Instructor Guided Training
- Computer Based Training
- Lower Level Device
- FTD FAA Level 7
- Full Flight Simulator (Motion)
AREA OF INNOVATION

Use of Distance Learning tools to enable early learning of procedures
- Leverage technology earlier in training
- Flows, standard operating procedures, flight profile activities and callouts
- Provide training in a way ‘familiar’ with the next generation
AREAS OF INNOVATION

Augmented Reality/Virtual Reality

Exterior Preflight

PROCEDURE TRAINING
Leverage Distance Learning Content on Lower Level Training Devices

Content Guided Lessons

- Build upon the procedures knowledge gained through distance learning
- Incorporate Evidence Based Training and Competency Based Training concepts
- Empower students to obtain more training, and access to review content if desired
**AREAS OF INNOVATION**

**PROCEDURE TRAINING**

Leverage Distance Learning Content on Lower Level Training Devices

**Content Guided Lessons**
- Integrate within a Training Management System
- Track and record student actions for instructor review and analysis
- Improve Ground Instructor efficiency
ANOTHER STEP FORWARD
WORLD’S FIRST LEVEL 7 FAA DEVICE

FAA Level 7 increased fidelity and functionality including:

- FFS comparable visual scenes
- Reduced latency or transport delay – 100ms for instrument systems and 120ms for visual
- FFS software load
- Validation for First Officer controls
- Improved aural cues matching that of FFS
- Increased control feel dynamics to replicate aircraft

Fidelity meeting the FFS
Reduced infrastructure requirements
Reduced initial and operating costs a FFS
Part 60 outlines Tasks vs FTD Level – Subjective Requirements

- Increased subjective requirements for FAA FTD Level 7
- FAA will be incorporating additional Part 60 defined FSTD levels into the pilot training and checking requirements
- Assuming the FAA updates similar to Subjective Requirements, these will have a strong impact on FTD utilization for initial training

Utilization as part of recurrent training

- Field Study for use in recurrent training (US AQP Airline)
AREAS OF INNOVATION
FAA LEVEL 7 FTD

Potential additional task credit for a Level 7 FTD include (majority qualified for introductory initial or recurrent qualification training):

- Taxiing
- Takeoff (normal, crosswind, instrument, engine failure)
- Windshear recovery
- Precision Approach (One engine inoperative)
- Circling Approach
- Missed Approach (One engine inoperative)
- Landings and Approach to Landing

Additional tasks acceptable for Level 7 FTD and lower (not currently noted for training credit):

- Takeoff and Departure Phase – Rejected Takeoff
- Engine Failure (Inflight Maneuver)
- Circling Approach
- Missed Approach (Normal)
- Flight Control Systems (Normal / Abnormal Procedures)
Just-in-Time Training Capabilities

- Maintenance and Pilot Departments
- Ensure minimum level of competency during training events
- Relevance to the operations environment as well
- Why not provide tools to prepare and/or augment a crew for unique operational requirements?
  - Interactive Computer Based Training
  - Simulations
  - Videos
  - Augmented Reality
COST BENEFITS

SUMMARY

With the improved training efficiencies, cost reductions can be recognized:

- Improved utilization of instructors and devices
- Efficiencies in reporting and assessment
- Reduction of training center footprint due to increased distance learning and small infrastructure requirements

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Future Type Rating Curriculum

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- Lower Level Device
- FTD FAA Level 7
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THANK YOU