



ADVANCING FTD TECHNOLOGIES AND THE OPPORTUNITY TO THE PILOT TRAINING JOURNEY

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Commercial Training Solutions

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





EXAMPLE TYPE RATING

CURRENT TRAINING JOURNEY





TOTAL TRAINING SOLUTION TYPE RATING PROGRAM

UTILIZING L3 CTS PRODUCTS

SYSTEMS
KNOWLEDGE

PROCEDURE
TRAINING

MANEUVERS
VALIDATION

LINE ORIENTATED
SCENARIOS

LOE / CHECKRIDE

Mobile Applications

Flat Panel Devices

FFS

FFS

FFS





FAA TYPE RATING

SYNOPSIS USING ADVANCED TRAINING SIMULATION AND TECHNOLOGY

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)



AREAS OF INNOVATION

2

PROCEDURE TRAINING



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

2

PROCEDURE
TRAINING



Exterior Preflight



Augmented Reality/Virtual Reality





AREAS OF INNOVATION

2

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

2

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

The screenshot displays a software interface for tracking training activities. At the top, it shows 'Group Reports By:' with options for 'Station' and 'Exercise'. The current report is for 'IR Data Invalid' at 'FIM 34-21 Task 806'. The 'START TIME' is 2:30 PM 1/24/2018 and the 'END TIME' is 2:42 PM 1/24/2018. A sidebar on the left lists various stations, with '1/24/2018' selected. The main area shows a 'STARTED' log with a list of events, each with a timestamp and a status icon (green checkmark or blue question mark). A 'TOTAL TIME' box at the bottom indicates '11 Minutes 44 Seconds'. A 'REFRESH' button is located at the bottom left of the interface.

STATION	START TIME	END TIME
Student1	2:30 PM 1/24/2018	2:42 PM 1/24/2018

Event	Time	Status
ADIRS L CURRENT STATUS accessed	00:03:19	✓
Left IRS Mode Sel switch value changed	00:03:34	✓
FSEU EXISTING FAULTS Test started	00:05:53	?
ADIRU removed	00:06:29	✓
Left Pitot ADM removed	00:07:43	✓
Continuity Check between connector D	00:07:59	✓
Left Pitot ADM installed	00:08:54	?



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

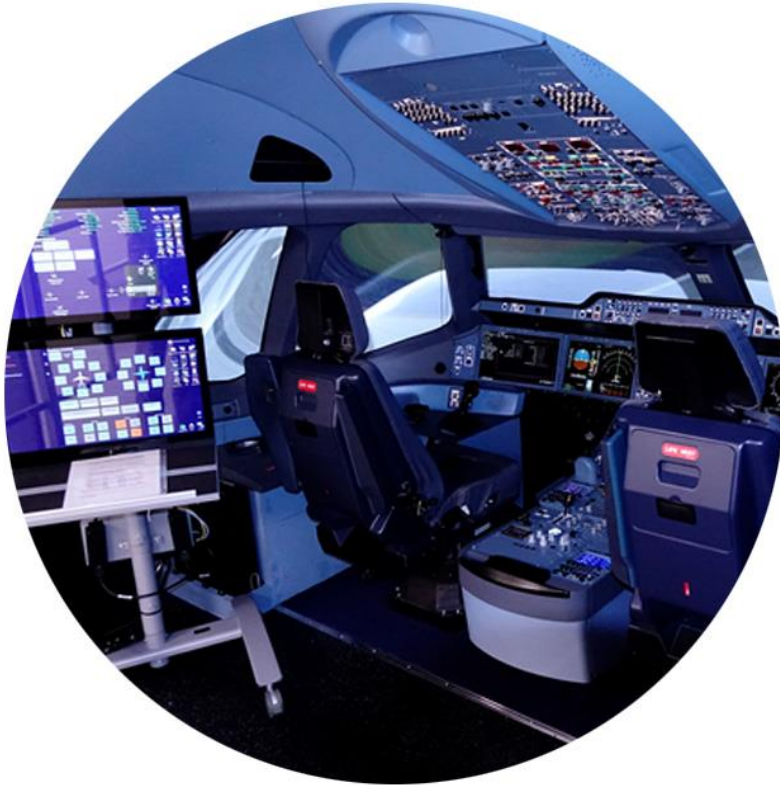


Fidelity meeting the FFS
Reduced infrastructure requirements
Reduced initial and operating costs a FFS



AREAS OF INNOVATION

FAA LEVEL 7 FTD



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 AND OPERATIONS INNOVATION



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

Traditional Type Rating Curriculum



- Ground Instructor Guided Training
- Flight Simulator (Non-Motion)
- Full Flight Simulator (Motion)

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

Future Type Rating Curriculum



- Ground Instructor Guided Training
- Computer Based Training
- Lower Level Device
- FTD FAA Level 7
- Full Flight Simulator (Motion)



THANK YOU



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