



FAA/INDUSTRY TRAINING STANDARDS- FLIGHT TRAINING FOR THE 21ST CENTURY

FAA Center of Excellence for General Aviation Research
(CGAR)

*Robert A. Wright, Manager
General Aviation and Commercial Division
Flight Standards Service
Federal Aviation Administration
&
Professor Frank Ayers
Embry Riddle Aeronautical University
Principal Investigator, FITS*



FAA Industry Training Standards (FITS)



FITS Mission Statement

Improve pilot learning to safely, competently, and efficiently operate a technically advanced piston or light jet aircraft in the modern National Airspace System (NAS).

FITS Imperatives:

Pilot training in technically advanced Aircraft will require an emphasis on realistic scenario based training to develop the higher order thinking skills required to help reduce the General Aviation accident rate to meet the SAFER SKIES standard. FITS will also concern new CNS ground systems and related airspace and procedures, and the problem of new-entrant pilots flying for transportation purposes



Focus on Higher Order Thinking Skills

Help pilots learn “how to think” instead of simply “what to think”



EMBRY-RIDDLE
AERONAUTICAL UNIVERSITY



WHAT IS FITS?



A modernized training philosophy that incorporates:

- 🔥 Risk Management
- 🔥 Aeronautical Decision Making
- 🔥 Situational Awareness
- 🔥 Single Pilot Resource Management



All without compromising what we do well today!



FITS FOCUS



- Technically Advanced Aircraft (TAA)
- Propeller driven or light jet
- Personally or professionally flown
- Used for transportation
- Operations under Part 91





“FITS Incentives”



✓ Owner/Pilots

- ✓ Improved Safety
- ✓ Lower Insurance Rates
- ✓ Better Quality Training
- ✓ More TAA Business Utility



✓ Aircraft Manufacturers

- ✓ Improved Safety
- ✓ Create a Training “Relationship” with Owners
- ✓ Partnership with the FAA to create realistic standards
- ✓ More freedom to design appropriate training programs



✓ FAA

- ✓ Improved Safety
- ✓ Supports “SAFER SKIES” initiative
- ✓ Requires minimal rulemaking





WHO IS INVOLVED IN FITS?



 **Center of Excellence for General Aviation**
Embry Riddle Aeronautical University
University of North Dakota

 **Launch Customers**
Cirrus Design
AirShares
Eclipse Aviation





TRAINING PROVIDERS



- 🔥 AOPA-ASF
- 🔥 King Schools
- 🔥 Jeppesen
- 🔥 Electronic Flight Solutions
- 🔥 Sporty's





FOLLOW-ON CUSTOMERS



To ensure that products can be used for other aircraft/applications

Adam

Diamond

Lancair

Garmin

Avidyne

Cessna





OTHER SEGMENTS OF AVIATION



- | 🍌 **NBAA**
- | 🍌 **Helicopters (Robinson)**
- | 🍌 **Calls from other manufacturers**
 - Mitsubishi
 - Avocet
 - Centaur Seaplane





Scope



- 300,000 Dollar FAA Grant for 2003
- 330,000 Dollar Follow – Grant for 2004
 - **FITS Products - 2003**
 - Seven Distinct Syllabi
 - Two Demonstration Modules
 - **FITS Deployment 2004**
 - Evaluate Effectiveness of On Going FITS Training
 - Improved Judgment and Decisions
 - Improved Automation Management
 - Improved Situational Awareness
 - Identify Areas for Improvement
 - Integrate Changes to Syllabi
 - Assist New FITS Partners
 - Develop Supporting Guides for Syllabus Development, Instructors, and Evaluators
 - Develop FITS GPS Training Standards



Product Oriented
Research!!

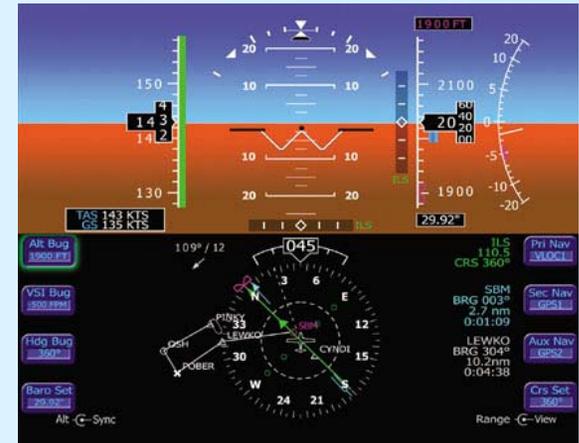




Approach



- ✓ Review of the Literature
- ✓ Review of the best that industry and the military had to offer
- ✓ Survey user needs
- ✓ Integrate TAA Safety Study results
- ✓ Develop a strategy for learning transfer
- ✓ Develop “generic” syllabus products
- ✓ Work with partners to develop specific curriculum
 - Test for validity
 - Develop implementation guides for instructors, course developers
 - Study FITS application to Advanced Navigation and Data link Situational Awareness Systems Training



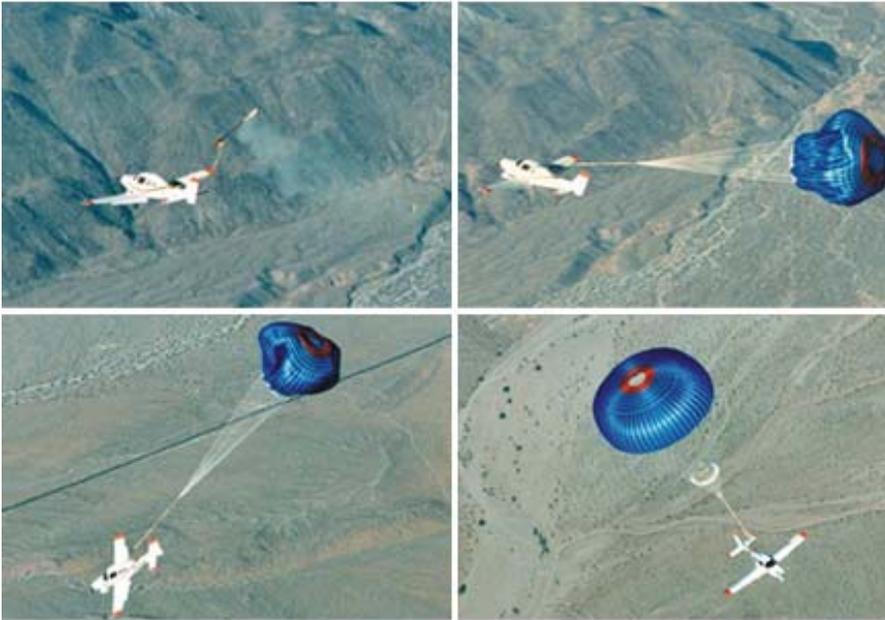


Technically Advanced Aircraft (TAA)



A General Aviation aircraft that combines most or all of the following design features;
advanced cockpit automation system: (Glass Cockpit), GPS with moving map, automated engine and systems management, and integrated autoflight/autopilot systems, for IFR/VFR flight operations. _

TAA Safety Study



Emergency Escape Maneuver

A maneuver (or series of maneuvers) performed manually or with the aid of the aircraft's automated systems that will allow a pilot to successfully escape from an inadvertent encounter with Instrument Meteorological Conditions (IMC) or other life-threatening situation.



Perception and Decision Making

“The Diminishing Value of Experience”



With increased automation the role of experience is further limited. Klein (1997) notes the importance of pattern recognition. Experienced pilots more quickly discern problems because they see recognizable patterns. For example, the simultaneous failure of attitude and heading information in a single engine aircraft immediately suggests vacuum pump failure to the experienced General Aviation pilot. However in an all-electric glass cockpit, that set of cues may have a completely different meaning.





Scenario Based Training



Attempts to use the best of all 3 accepted learning models to prepare the learner to problem solve in ambiguous situations

- Knowledge is constructed from experience
- Learning is an active process
- Learning should be situated in realistic settings, testing should be integrated with the task, and not a separate activity.





Single Pilot Resource Management (SRM)



The art and science of managing all the resources (both on-board the aircraft and from outside sources) available to a single-pilot (prior and during flight) to ensure that the successful outcome of the flight is never in doubt.

SRM skills include Aeronautical Decision Making, Task and Automation Management, Situational Awareness, Risk Management, and CFIT awareness





Aircraft Automation Management



The demonstrated ability to control and navigate an aircraft by means of the automated systems installed on board the aircraft.





FITS Products



Part 141/142 “Special Curriculum”
Provisions

allow:

“ Innovation Without Regulation ”

- **Transition**

- **In-use (1 June, 2003)**

- <http://www1.faa.gov/avr/afs/fits/>

- **Instructor**

- **Recurrent**

- **Ab-Initio**

- **AGATE Based**

- **Scenario based**





Questions?

Dr Thomas Connolly – ERAU
Professor Charlie Robertson – UND
Mr. Bob Wright – FAA
Professor Frank Ayers - ERAU

<http://www1.faa.gov/avr/afs/fits/>