

General Aviation's Technology Transition

Presented to: SETP Flight Test Workshop

By: FAA Small Airplane Directorate

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Date: May 2010



Federal Aviation
Administration



Overview

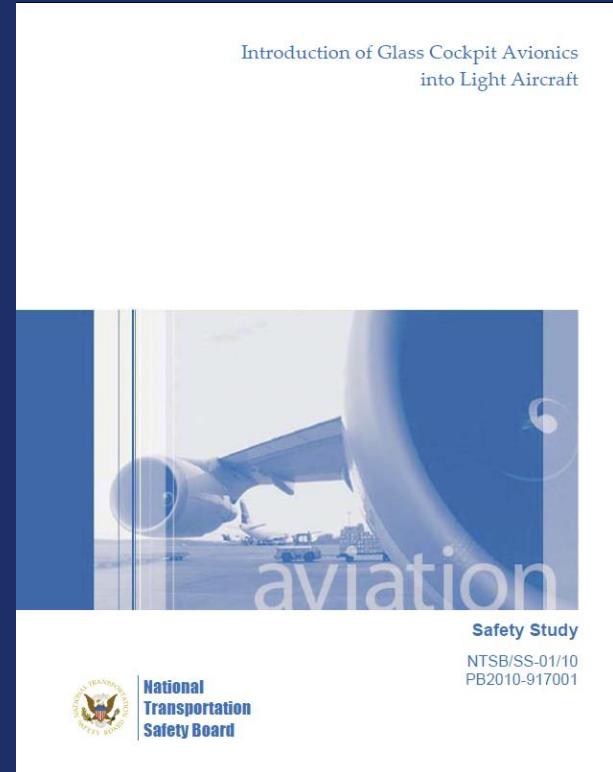
- NTSB Report Perception
- Brief History Part 23 Technology
- TAA Accident Studies
- New Technology Evaluation Approaches



NTSB Safety Study – Perceptions

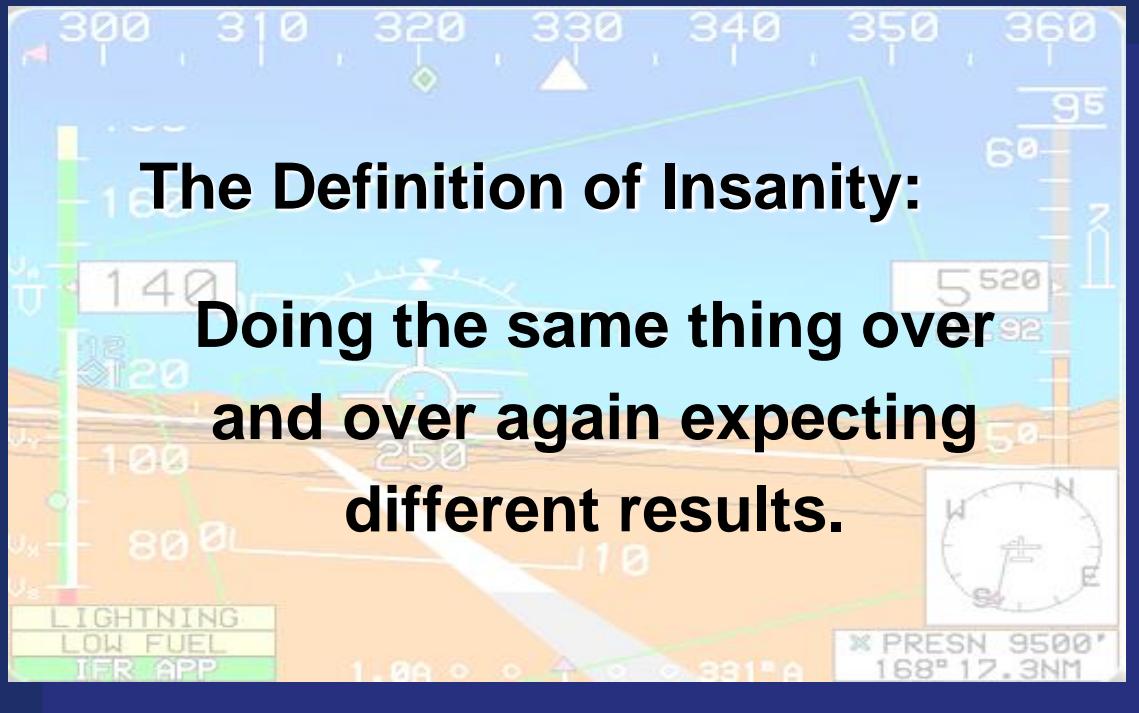
The results of this study suggest that, for the aircraft and time period studied, the introduction of glass cockpit PFDs has not yet resulted in the anticipated improvement in safety when compared to similar aircraft with conventional instruments

- there has been a perception that we have said yes to every new technology that has come along
- we believe that we have not only used a process for each new technology, but may be more standardized than part 25
- disappointed that the report tried to compare too many variables



Part 23 Situation In The Early 1990's

Here we were trying to reduce fatal accidents and yet our regulatory structure was so over bearing that we essentially wouldn't allow new technology into small airplanes. Hence the definition of Insanity.....



NASA / Industry / Universities / FAA Mid – 1990's AGATE Program



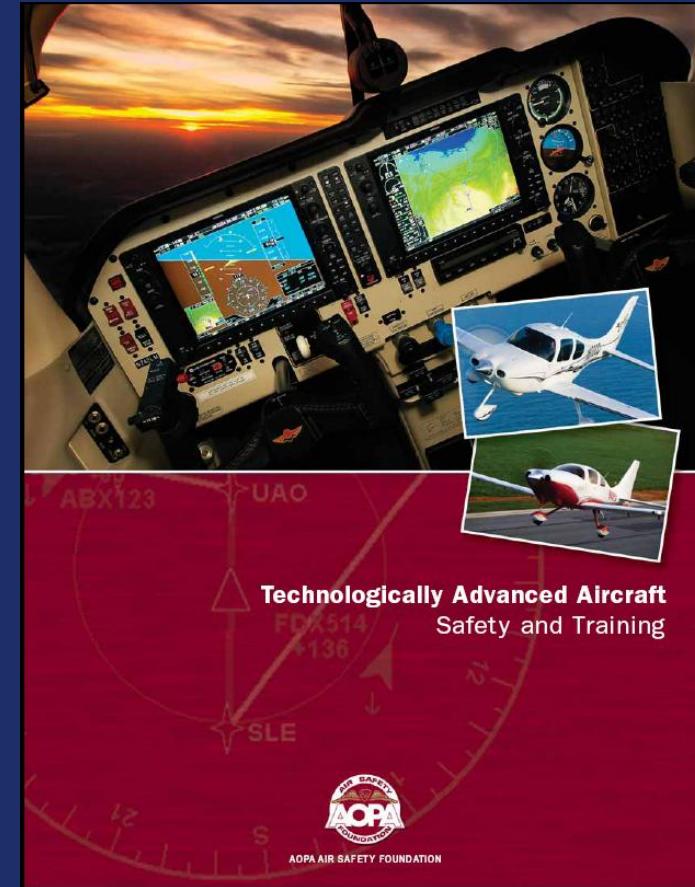
TAA Accident Studies

General Aviation
Technically Advanced Aircraft

FAA – Industry
Safety Study

Final Report of
TAA Safety Study Team

August 22, 2003



General Aviation Technically Advanced Aircraft FAA/Industry Safety Study, 2003 - Findings

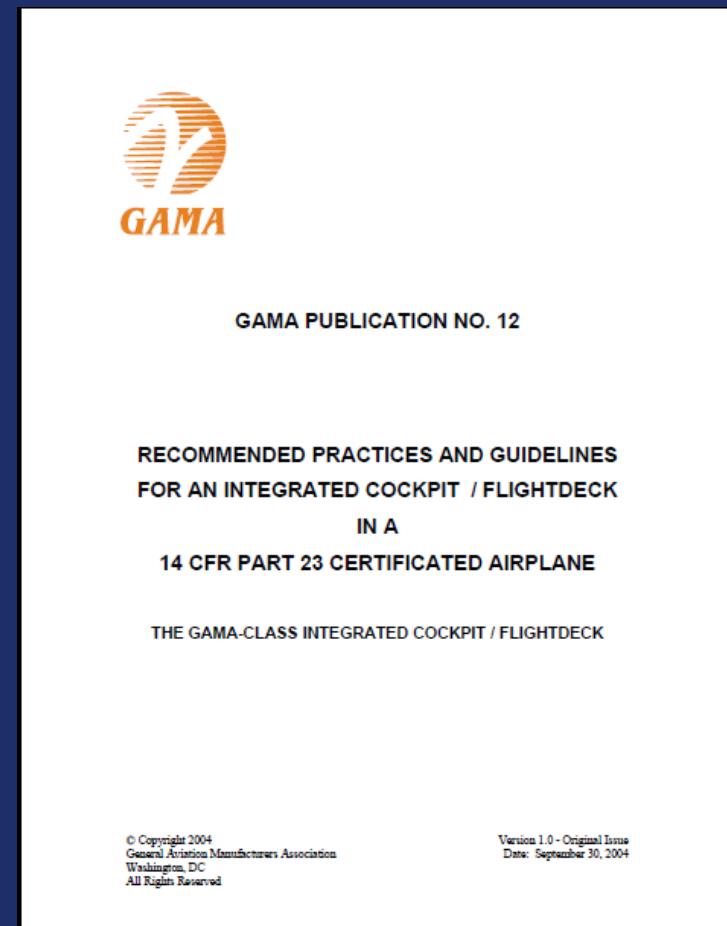
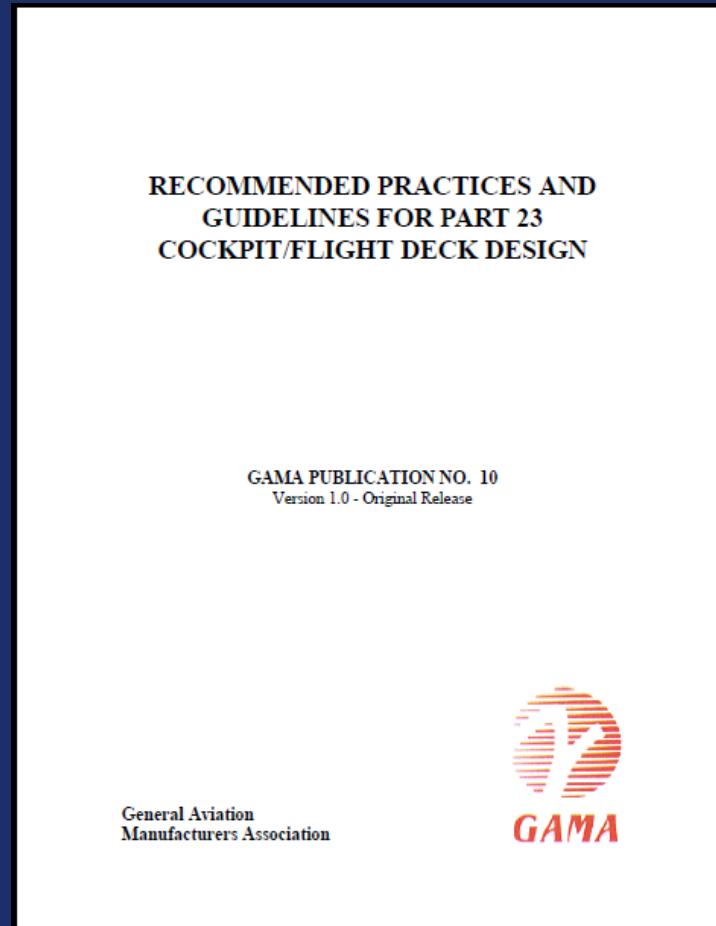
4. TAAs provide increased “available safety”, i.e., a potential for increased safety. However, to actually obtain this available safety, pilots must receive additional training in the specific TAA systems in their aircraft that will enable them to exploit the opportunities and operate within the limitations inherent in their TAA systems.

Typical New Part 23 Panel



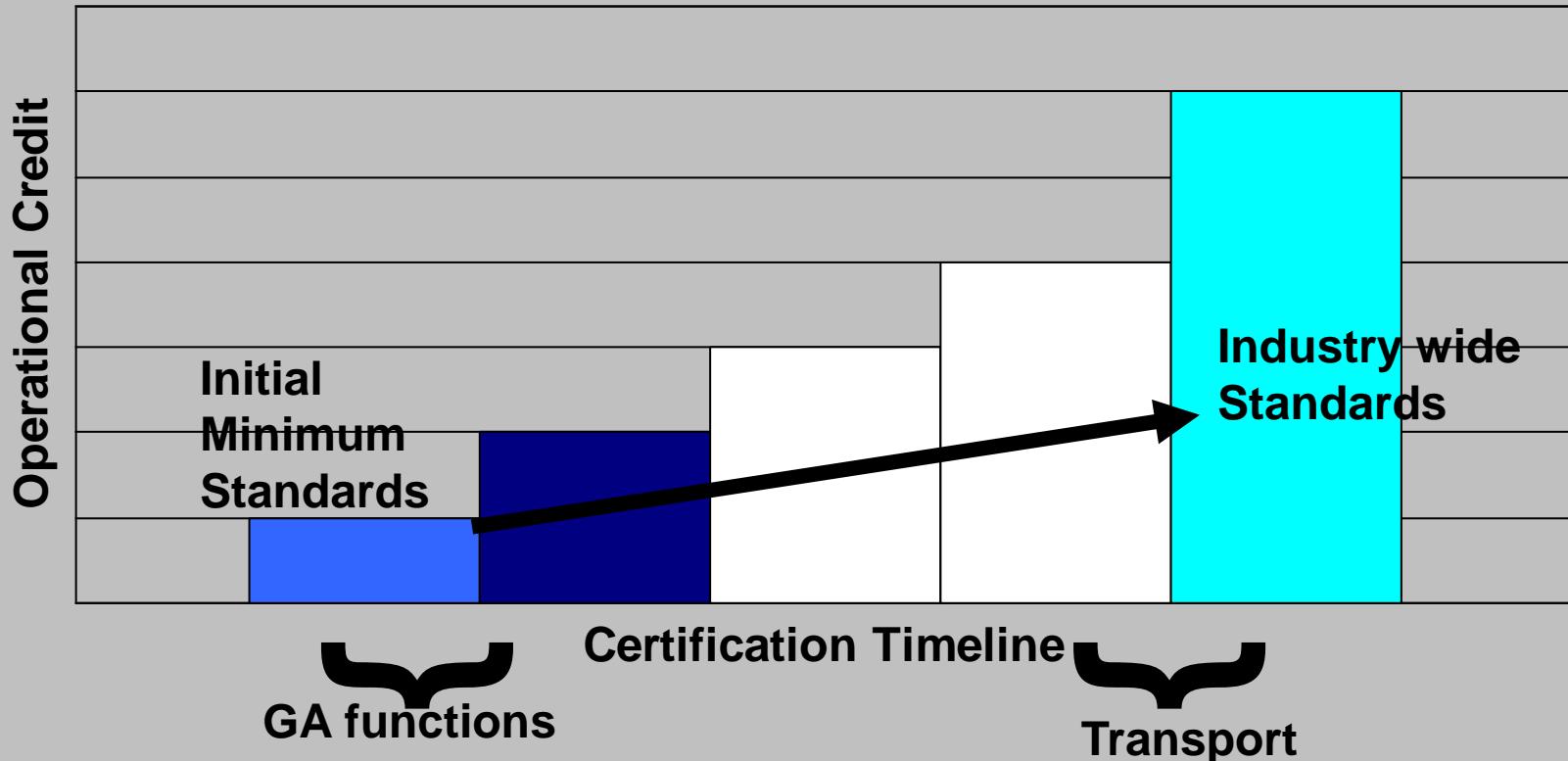
- 5700 new airplanes equipped w/ glass as of 2007
- With Aspen and Garmin retrofit glass we are probably close to 8000 airplanes
- Current sales could put another 10,000 PFDs in existing airplanes in the next 5 years

New Equipment - Standardization



Requirement Evolution

- Increasing maturity over time



- Building on core functions

Examples of Success

- Many items prototyped in GA, with later growth into more critical functions
 - Moving Map GPS & WAAS
 - Synthetic Vision & Enhanced Vision
 - ADS-B In/Out
 - Inflatable restraints
- Each gained operational experience where potential benefit was high and initial risk was managed & acceptable
- Standards development evolved with the technology



Are We There Yet?

No. We have not meet the “ease of operation” goals set by AGATE.

- While idealistic - our goal for GA avionics was and still is that a pilot can use the equipment for a basic IFR flight without any training.
- Need a top level automation philosophy for part 23



iPhone Ease of Use



Tomorrow's Concepts

- Enhanced single pilot ops
- Digital autopilots with auto-throttles & envelope protection
- Emergency auto-land for pilot incapacitation
- IFR becoming VFR Equivalent
- Automation is key: Virtual co-pilot, intelligent auto-flight, intuitive touch screen navigation



SATS-Cockpit Concept
NASA Langley Research Center

2/3/2000

Image # EL-2000-00008

Our Common Challenge

- We play a key role in future industry success & must consider the impact of our actions - Innovation is not automatic, it takes action & cooperation
- Our primary focus on promoting safety, but we must be receptive to new ideas & new technologies
- We must be willing to be innovators as well as regulators – We learn from past, but shouldn't fear change



Questions / Feedback?

