

SAFETY
EVERY STEP OF THE WAY



LESSONS LEARNED FROM AVIATION'S SAFETY RECORD

WHAT WE CAN APPLY TO THE OCCUPATIONAL SETTING

CHET BRANDON, CSP, CHMM

CENTRAL INDIANA ASSE CHAPTER MAY MEETING

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AGENDA



- Aviation's Safety Record
- Equipment Design and Approval
- Regulations
- Training
- Human Error
- Complexity of Aerospace
- Lessons for Industry

SAFETY IN THE SKY

Airliner Accidents Per 1 Million Flights 1977-2017



- In 2017 commercial aviation flew over 4 billion passengers on 38 million flights without a single fatality in a scheduled jet airliner.
- The fatal accident rate for large commercial passenger flights is 0.06 per million flights, or one fatal accident for every 16 million flights.

HOW IS THIS ACHIEVED?



“One of the ways that we have become so safe was to realize that our efforts were never going to be good enough.”

- John Cox is a retired airline captain with US Airways and runs his own aviation safety consulting company, Safety Operating Systems.

EQUIPMENT DESIGN SAFETY & APPROVAL



Design Safety for Aerospace

- Part reliability increased
- Maintenance requirements
- Inspection requirements
- Consensus Standards

FAA Certification Process

- Part design approval
- Type Certificate
- Airworthiness Certification

RIGOROUS REGULATORY OVERSIGHT



- Air Traffic Control System
- Flight Services (weather forecasts, ATC advisories)...
- Accident Investigation
- Federal Aviation Regulations (FARs) Promulgation and Enforcement
 - 14 CFR Part 91 - GENERAL OPERATING AND FLIGHT RULES
 - 14 CFR Part 61 - CERTIFICATION: PILOTS, FLIGHT INSTRUCTORS, AND GROUND INSTRUCTORS
 - 14 CFR Part 107 - SMALL UNMANNED AIRCRAFT SYSTEMS
 - 14 CFR Part 119 - CERTIFICATION: AIR CARRIERS AND COMMERCIAL OPERATORS
 - 14 CFR Part 141 - PILOT SCHOOLS
- Other
 - Advisory Circulars (ACs)
 - Airworthiness Directives (ADs)

EXTENSIVE TRAINING PROGRAMS



- Ground Training
 - Written knowledge test
- Flight Training
 - Skill Demonstration with CFI
- Practical Test with FAA Designated Pilot Examiner
 - Ground Examination (Oral)
 - Flight Examination (Skills demonstration)

AVIATION RISK MANAGEMENT



- PAVE
- Aeronautical Decision Making
- Crew Resource Management (CRM)
- Automation Management
- Safety Management Systems

HUMAN ERROR AVOIDANCE



- Use of Checklists
- Adherence to procedures
- Detailed flight planning
- Crew resource management
- Harmonized automation for pilots

SAFETY CULTURE OF AVIATION



- Operational discipline
- Skills proficiency and maintenance
- Knowledge proficiency and maintenance
- Continuous recognition and management of risk

COMPLEXITY OF THE AEROSPACE ENVIRONMENT

Endless opportunities for Accidents...

- Simple Human Error
 - [NTSB Opens Docket for San Francisco International Airport Incident](#)
 - Highly experienced professional pilots confused about runway location.

FOCUS ON HUMAN ERROR AND PERFORMANCE



- Errors
 - Skill-based
 - Rule-based
 - Knowledge-based
- Performance Traps
 - Latent Failures
 - Active Failures

LESSONS FOR INDUSTRY: KEY TAKEAWAYS



- Demand a higher standard of performance
- Be preoccupied with failure and preventing it
- Frequently train in the classroom and require demonstration
- Maximize pre-job planning
- Engineer in extra reliability
- Focus on human performance/human error reduction
- Maximize organizational discipline

INTERESTED IN LEARNING TO FLY?



Eagle Flyers Flight School:

<https://www.montgomeryaviation.net/>

Eagle Flyers I – Fractional Ownership:

<https://www.facebook.com/IndyExecFlyers/>

FURTHER READING

- FAA, Safety, retrieved on line on 5/10/18 at:
https://www.faa.gov/about/safety_efficiency/
- FAA, 2009, Risk Management Handbook. U.S. Government
- Reason, J. 1990. Human Error. Cambridge, U.K.: Cambridge University Press.

“

You've got to expect things are going to go wrong. And we always need to prepare ourselves for handling the unexpected.

”

- Neil Armstrong

Thank you!



CHET BRANDON

VP of Operations & Corporate Safety Officer

ATI Worksite Solutions

Ph: 844-INJ-PREV (844-465-7738)

Web: www.atiworksitesolutions.com

Email: ronald.brandon@atipt.com

