



## **Automation Dependency Outline**

### **“You are the 5% Solution, 100% of the Time”**

Crew Resource Management training is required by the FAA Safety Inspectors Handbook, Order 8900.1 and ICAO Annex 6. A specific curriculum for a pilot to be considered qualified in Human Factors may be found in the United Kingdom’s CAP Publications #719 and #737.

- Biology
  - Visual and vestibular illusions
  - Approach and landing problems
  - Spatial disorientation
- Physiology
  - Nervous System
  - Basic anatomy, functioning and limitations
  - Reflexes and biological control systems
- Psychology
  - Basic anatomy, functioning and limitations
  - Sensory threshold and sensitivity
  - Sensory adaptation and habituation
  - Stages of memory
    - Long-term memory
    - Skills memory vs. Fact memory
  - Myth of Multi-Tasking
  - A Pilot Personality Inventory
- Sociology
  - Personality Attitudes
  - Motivations Culture issues
  - Team working implications
- Reliability of Human Behavior
  - Design Philosophy and Primary role of a pilot
  - Training proficiency vs. operational efficiency
  - Error types and generation
- Human Error Defined
  - Human Factors Analysis and Classification, HFACs
    - Skill based errors
    - Decision based errors
    - Violations
    - Perceptual errors

## Organizational and administrative errors

- Operational Aspects of Automation
  - Raw data vs. computer derived information
  - Selection of level of automation
  - Maintenance of basic flying skills
  - Event similarity and frequency
- Automation and Standard Operating Procedures
  - Philosophies, policies, procedures and practices
  - Rationale and benefits derived from SOP's
  - The role of operational leadership
- Airmanship Exercise#2 "It's In the Cards"
  - Defined in terms of: Training Experience Judgment
  - Standard Operating Procedures
  - Aeronautical Decision Making Models
    - PAVE Checklist
    - ODDA Loop
- Threat and Error Management
  - Defined as "Defensive flying for pilots
  - Line Operations Safety Audit explained
  - Threats, Errors and Undesired aircraft states
  - Risk factors and occurrence
  - Risk Mitigation and Countermeasures
    - Anticipation
    - Recognition
    - Recovery
    - Planning
    - Execution
    - Review/Modify

### References:

- "Review of Civil Aviation Accidents, 2007-2009", NTSB/ARA-11/01 NTSB 2011  
"Statistical Summary of Commercial Airplane Accidents, 1959-2012" Boeing, 2012  
"22<sup>nd</sup> Joseph T. Nall Report", AOPA Air Safety Foundation, 2010  
US Navy Safety Center Accident Statistics, USN, 2013  
US Army Aviation Accident Statistics, USA, 2013  
USAF Accident Statistics, USAF, 2012  
"Checklists and Monitoring in the Cockpit: Why Crucial Defenses Sometimes Fail" NASA/TM—2010-216396 K. Dismukes and B. Berman, July 2010  
"Human Error and Commercial Aviation Accidents: A Comprehensive, Fine-Grained Analysis Using HFACS." DOT/FAA/AM-06/18, Shappell, et al, 2006  
"Personality Studies in Aircrew, an Overview", Dr. Ganesh A, Dr Catherine Joseph, 2005  
"NASA Pilot Personality Profile" Fitzgibbons, Davis, Schutte, 2006  
"Practical use of Pilot Personality Profile" Robert Rose PhD, 2001  
"Human Factors Analysis and Classification System", Shappell and Weigmann, FEB 2000  
"Human Error", J. Reason, 1990  
"Human Error and General Aviation Accidents" Shappell et al; DOT/FAA/AM-05/24, Dec 2005  
"Darker Shades of Blue", T. Kern 2006