Responding to the Emergency- Using all the Tools

Flight Path Management

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PARC/CAST Flight Deck Automation Working Group (FltDAWG)

28 Findings
18 Recommendations

Data Sources:

26 Accidents (1996 – July 2009)

20 Major Incidents (1996 - July 2009)

734 ASRS Reports (2001 – 2007)

9155 LOSA flights, including 2200 narratives regarding "use of automation" marker

11 Operators, 6 OEM's, 17 ATO's

Note: Findings were not specific to a particular manufacturer, operator, or other organization

Finding 1: Pilot Mitigation of Safety and Operational Risk

Pilots frequently mitigate safety and operational risks – and the aviation system is designed to rely on that mitigation

- Adapting to changes in operational circumstances
- Managing operational threats
- Mitigating or managing errors
- Mitigating equipment limitations
- Managing equipment malfunctions
- Managing unexpected operational risk

Note: List is not comprehensive

Finding 2:
Manual Flight Operations

Vulnerabilities were identified in pilot knowledge and skills for manual flight operations, including:

- Prevention, recognition and recovery from upset conditions, stalls or unusual attitudes,
- Appropriate manual handling after transition from automated control,
- Inadequate energy management,
- Inappropriate control inputs for the situation,
- Crew coordination, especially relating to aircraft control,and
- Definition, development, and retention of such skills.

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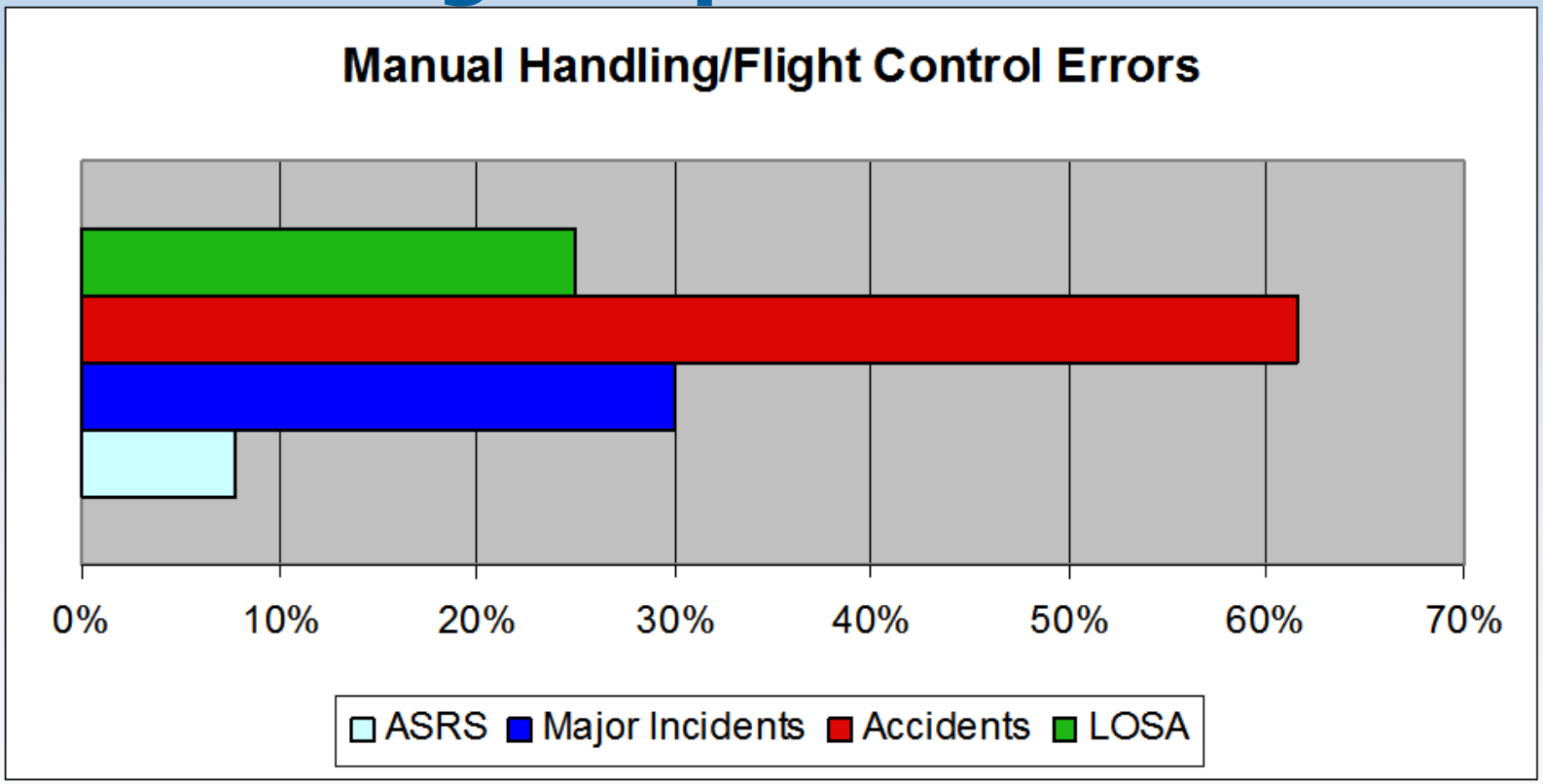
Manual Handling Operations

Finding 2:
Manual Flight Operations



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Finding 4: Automated Systems

Automated systems have contributed significantly to improvements in safety, operational efficiency, and precise flight path management.

Vulnerabilities found in pilot use of automated systems:

- Pilots sometimes rely too much on automated systems and may be reluctant to intervene,
- Autoflight mode confusion errors continue to occur,
- The use of information automation is increasing, including implementations that may result in errors and confusion, and
- FMS programming and usage errors continue to occur.

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Other Significant Findings

Finding 9 – Operator Policies for Flight Path Management

- …… improvements could be made to better focus attention on the flight path management related tasks and more effectively use automated systems.

Finding 10 - Task/Workload Management

- Flight deck task/workload management continues to be an important factor affecting flight path management.

Finding 11 - Pilot Knowledge and Skills for Flight Path Management

- Pilots sometimes lack sufficient or in-depth knowledge and skills to most efficiently and effectively accomplish the desired flight path management related tasks.

Other Significant Findings

Finding 12 - Current Training Time, Methods, and Content

- Current training methods, training devices, the time allotted for training, and content may not provide the flight crews with the knowledge, skills and judgment to successfully manage flight path management systems.

Finding 13 – Flight Instructor Training and Qualification

- Flight instructor training, experience, and line-operation familiarity may not be sufficient to effectively train flight crews for successful flight path management. This will be especially important for future operations.

So Where Do We Go From Here?

We need to Train like we Fly, and

Fly like we Train

Improvements Needed

- Develop Flight Path Management policy & training
- Improve Manual Handling Operations
- Integrated CRM and normal/non-normal procedures training
- Integrated CRM and maneuvers training
- Emphasize Crew Performance
- Improve instructor knowledge and training skills
- Improve Training methodologies
- Realistic scenario-based training

Parting Thought

Finding 1: Pilots frequently mitigate safety and operational risks – and the aviation system is designed to rely on that mitigation

- **What can you do to improve crew operational effectiveness to ensure pilots have the knowledge, skills, and airmanship qualities to continue to mitigate safety and operational risks in the current aviation system and NextGen?**

Cheers,

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