Managing Automation or Managing Aircraft Flight Path: How does Operational Policy Need to Evolve?

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Overview

• Operator automation policies
• Flight path management – what is it?
• Content of operational policy – potential topics
Operator Automation Policies

• Most airlines have a policy for operational use of automated systems
• Content varies
• Maximize use of automation

But

• Flying is more than use of automated systems
Flight Path Management

“Flight Path Management” is the planning, execution, and assurance of the guidance and control of aircraft trajectory and energy, in flight or on the ground.*

*Flight Path Management Working Group, Air Carrier Training Aviation Rulemaking Committee
Flight Path Management

• Manual flight operations
• Managing automated systems
• Flight path monitoring and intervention
• Managing energy state
• Operating in the airspace
• Stabilized approach
• Go-around decision and implementation
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Manual Flight Operations

• When and how to fly “manually”
• Manual flight operations include more than “stick and rudder” motor skills
• There are many cognitive skills needed for manual flight operations
Examples Requiring Motor and Cognitive Knowledge and Skills

• Spatial reasoning needed for visual or non-precision approaches
• Go-arounds/missed approaches, especially all-engine and at altitudes higher than DA/DH
• Returning to nominal flight path after a flight path deviation
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Managing Automated Systems – Example Topics

- When to turn on or off
- Mode awareness
- “Levels” of automation?
- Dealing with anomalies or confusion
- Guidance versus control
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Monitoring and Intervention

- Define **roles** of Pilot Flying/Pilot Monitoring
- Define **activities** of monitoring – tasks done by both pilots
Skills?

Technical

PF

Non Technical

- CRM / NTS
- Intent / Challenge
- Aircraft Systems
- Flight Path
- a/c + ATC
- Modes
- Rules of thumb
- Manual
- Recovery
Communication and Intervention

- Intent
- Challenge
- "Help"
- "Unable"
- Take-Over

- Knowledge
- Program
- Modes
- Levels

- Information Automation
- Uploads
- Crossfills
- Mode Changes

- Advisories
- Displays
- X-check?
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Managing Energy State

• Energy management in normal operations
• Recognition/recovery from undesired energy state
  – Autopilot/Autothrust mode interaction
  – Power Setting/Configuration/Drag Devices
  – Application of TEM/CRM
  – Upset recovery
• Guidance for off-nominal energy states
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Operating in the Airspace

- Tell air traffic “unable” when appropriate
- Managing complexity
  - Large amounts of information
  - “Change fatigue”
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Concluding remarks

• Focus of operational policy needs to be on flight path management
• Improvements in operator policy/procedures
• Basics! Reminders!
Flight Path Management Working Group

https://www.eurocontrol.int/publications/hindsight-20-winter-2014

https://www.caa.co.uk/docs/33/9323-CAA-Monitoring%20Matters%202nd%20Edition%20April%202013.pdf
Thank you!

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