



Loss of Control – In Flight (LOC-I) Precursors and Mitigations

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Loss of Control-Inflight (LOC-I) A Worldwide Issue

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LOC-I: Leading Cause of Fatalities in Aviation Worldwide

Asia Pacific Region Accident Distribution by Category

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CFIT & LOC-I: Leading Causes for Fatalities in APAC

Accidents – Phase of Flight

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Percentage of fatal accidents and onboard fatalities



 A majority of accidents occurs during the approach & landing phase of flight

~60% Approach & Landing

 This includes CFIT, LOC-I, RE, USOS, ARC, Mid-Air Risk

High Risk Exposure in Terminal & High Traffic Density Areas

Precursors - Approach & Landing Accidents

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• Unstable approaches

- Too fast, too high, touchdown location etc. (RE)
- Mismanaged go-arounds (LOC-I)
- Loss of Airplane State Awareness (LOC-I, CFIT, USOS, ARC)
 - Energy state awareness
 - Attitude awareness
 - System mode awareness



Different Accident Categories Share Similar Precursors

Precursors - Approach & Landing Accidents

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- Flight Crew Distraction / CRM
- Ineffective Alerting
- Inappropriate Control Actions
- Lack of External References



Different Accident Categories Share Similar Precursors

The Go-Around Maneuver

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As a Safety Barrier

 An effective means to mitigate approach and landing accidents

The Challenges

- Accident history ⇒ LOC-I, ARC
- A unique maneuver:
 - Rarely flown and practiced



 Airplane configuration is likely lightweight, with excessive power available at sea-level

Go-Arounds – A Safety Barrier / A Challenge

Mitigation of LOC-I Risk

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Technology

- Changes in airplane system technology
- Effective alerting
- Simple mode design

Training

- Realistic Evidence Based training
- Upset Prevention and Recovery Training
- Stabilized approach criteria



SOP's

- Establish Standard Operating Procedures that represent best industry practice
- Encourage / Enforce adherence to SOP's

3-Prong Approach to Mitigate Fatality Risk

Mitigating LOC-I Risk Through Technology

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Effective use of operational data has driven safety technologies

Examples:

- Vertical Situation Display
- Roll Command Alerting System
- Envelope Protection
- Runway Overrun Warning

Data dictates research & development

- Automation
- Enhanced Airplane Displays
- Envelope Protection

Product Safety Enhancements Through Data Analysis

Go-Around Decision Making Conclusions

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- Terminal areas most exposed to accident risk
- Effective go-arounds are an important safety barrier to mitigate unsafe approaches
- The go-around maneuver has it's own challenges and risks that need to be understood, briefed and trained
- Training, adherence to SOPS, and new technologies are keys to mitigation the risks to LOC-I

