General Aviation Fixed-Wing Inflight Loss of Control Overview

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A Long Title

What does it mean?

Why are we concerned?
Definitions

• “Fixed-wing” and “Inflight” are fairly easy to understand

• Definitions for “General Aviation” and “Loss of Control” can be somewhat problematic
For General Aviation

• Differences in international and U.S. definitions of GA

• U.S. government statistics collection criteria differ from what industry might consider GA
In the U.S.

- Agreement that GA includes
  - FAR Part 91 flights, Part 125 large airplane (non-airline) flights, Part 137 agricultural application application flights, and non-military public use flights

- Part 121 and Part 135 scheduled airline flights are excluded as GA
In Addition

• Government entities separate “on-demand” Part 135 flights from GA in annual surveys of the GA fleet

• This presentation includes on-demand Part 135 as part of GA
U.S. Definition of LOC

- FAR/AIM: Not defined
- Pilot’s Handbook of Aeronautical Knowledge: Not defined
GA Joint Steering Committee

CAST/ICAO Common Taxonomy
Team definition:

“…an extreme manifestation of a deviation from intended flight path.”
In Simpler Terms

- The airplane won’t go where the pilot wants it to go
- The airplane does go where the pilot doesn’t want it to go
- It’s a surprise when it happens
NTSB Common Conventions

• LOCI is known as a “defining event” that best describes the accident scenario

• LOCI generally involves an aerodynamically sound airplane; it may not be mechanically sound but is still controllable
Also Noteworthy

- In 2008 NTSB updated database coding; thus accidents presented here are from 2008 through 2014

- Results provided are for U.S. registered airplanes on U.S. soil
NTSB Data 2008-2014 (Inflight)

• Total All Accidents: 9,751
• Total Fixed Wing Accidents: 8,730
• LOCI Fixed Wing Accidents: 1,518 (17.4% of all FW)
Fatal Fixed-Wing Accidents

- Total fatal: 1,553
- LOCI fatal: 721
  (46.4% of FW Fatal Accidents)
Number of Fatalities

• Total FW fatalities: 2,698

• LOCI FW fatalities: 1,237
  (45.8% of FW Fatalities)
FW LOCI by FAR

- 1425 Part 91 Flights
- 693 Fatal Part 91 Flights
- 1 Part 125 Flights
- 1 Fatal Part 125 Flights
- 28 Part 135 Flights
- 15 Fatal Part 135 Flights
- 48 Part 137 Flights
- 9 Fatal Part 137 Flights
- 7 PUBU Flights
- 3 Fatal PUBU Flights

Legend:
- Green: All FW LOCI Flights
- Red: Fatal FW LOCI Flights
FW LOCI Fatalities

- Part 91: 1189
- All others: 48
FW LOCI Flight Purpose

- **Personal**: 1102
- **Instructional**: 542
- **Aerial Application**: 63
- **Air Taxi/Cargo**: 48
- **Business**: 25
- **Positioning**: 25

**ALL FW LOCI Accident Flights**

**Fatal FW LOCI Accident Flights**

- **Personal**: 185
- **Instructional**: 18
- **Aerial Application**: 9
- **Air Taxi/Cargo**: 15
- **Business**: 18
- **Positioning**: 15
GA FW LOCI Light Conditions

All Accidents
- 90% Daylight
- 8% Dawn/Dusk
- 2% Night

Fatal Accidents
- 83% Daylight
- 13% Dawn/Dusk
- 4% Night
GA FW LOCI Weather Conditions

All Accidents
- 90% VMC
- 10% IMC

Fatal Accidents
- 88% VMC
- 12% IMC

IMC  VMC
What phases do they occur?

- **Takeoff** – To 35 feet/gear up selection

- **Initial Climb** – Takeoff to first power reduction or 1,000 feet above runway

- **En Route** - From end of Initial Climb through cruise, descent to VFR pattern altitude or 1,000 feet above runway elevation, whichever comes first (IFR: descent to IAF)
• **Approach** - From the point of VFR pattern entry, or 1,000 feet above the runway elevation, to the beginning of the landing flare. (IFR : IAF to landing flare)

• **Landing** - Beginning of the landing flare until aircraft exits the runway, comes to a stop on the runway, or when power is applied for takeoff in the case of a touch-and-go landing
• **Maneuvering** - Low altitude/aerobatic flight operations

• **Missed Approach/Go-Around**
  
  • From the first application of power until the aircraft re-enters the sequence for a VFR pattern (go-around) or until the aircraft reaches the IAF for another IFR approach (missed approach)
<table>
<thead>
<tr>
<th>Approach Type</th>
<th>Fatal LOCI</th>
<th>All GA LOCI</th>
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<tbody>
<tr>
<td>Approach - Not Specified - VMC</td>
<td>24</td>
<td>34</td>
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<tr>
<td>Approach-VFR Pattern Crosswind</td>
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<td>Approach-VFR Pattern Downwind</td>
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<td>Approach-VFR Pattern Base</td>
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<td>Approach-VFR Pattern Final</td>
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<td>Approach-VFR-Go-Around</td>
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<td>Landing</td>
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<tr>
<td>Landing Flare/Touchdown</td>
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<td>129</td>
</tr>
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</table>
Conclusions

• LOCI counts for about 45% of all fatal GA FW accidents and fatalities

• Overwhelmingly Part 91, day, VMC operations

• Major flight phases of occurrence: Maneuvering, Initial Climb, and Approach
• Although a small number of all LOCI accidents, those in IMC conditions approaching an airport will most likely result in a fatal outcome