Cirrus Aircraft
Company Overview

Company Philosophy

If we can deliver the <u>highest quality</u> aircraft available in class, at <u>reasonable cost</u>, incorporating the best available <u>safety technology</u>, we will change the entire GA industry.

Design Criteria
- ➢ Safe
- ➢ Comfortable
- ➢ Easy to operate
- ➢ Fast and appealing

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The Only Certified Aircraft with a Parachute

Cirrus Airframe
Parachute System
(CAPS™)
Safety System for
Use in Life-
threatening
Situations

31 Deployments
53 Lives Saved

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11 Years of the SR22: The Most Rapid Evolution In General Aviation History

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The Baseline Platform

- **First Delivery in Feb 2001**
    - 310 HP TCM IO-550-N
    - 6-Pack Flight Instruments
    - ARNAV MFD
    - Garmin GNS430
    - Century HSI
    - Sandel 3308 EHSI
    - S-Tec 55X Autopilot

And… <u>It Was Hot!</u> It was best equipped, most modern airplane in class. There was almost nothing else like it.

2012 vs 2001: What's New?

- Cirrus Aircraft has evolved the SR22 "a little bit" since it was introduced
- Why?
  - To Improve Safety
  - To Provide Better Information to the Pilot/Owner
  - To Improve Performance and Utility - Capability
  - To Improve Comfort and Appeal

- Because the customers wanted it!

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What's in a new 2012 SR22 that wasn't in a 2001 model?

Or,

How much could we do in 10 years?

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What's In a 2012 SR22 That Wasn't In a 2001 SR22?

- Safety Improvements
    - No Hazard Ice Protection (2002)
    - eTAWS – Terrain Avoidance (2004)
    - Beveled Firewall (2004)
    - Airbag Seat Harness (2005)
    - 406 MHz ELT (2006)
    - Wing Tip Recognition Lights (2007)
    - 2nd Air Data Computer (2009)
    - Flight Into Known Ice Capability (2009)
    - Air-Oil Energy Absorbing Nose Gear (2010)
    - Perspective Electronic Stability Protection (2010)
    - Hypoxia Detection, Automatic Descent Mode (2010)
    - Under Speed Protection (2010)
    - Coupled Missed Approach (2010)
    - Latch child restraint system (2012)

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What's In a 2012 SR22 That Wasn't In a 2001 SR22?

- Provide Better Information to the Pilot
  - Avidyne MFD (2002)
  - Integrated Traffic Information (2002)
  - eMax Engine Monitoring (2002)
  - Avidyne Entegra PFD (2003)
  - XM Weather Datalink (2004)
  - CMax Electronic Approach Charts (2004)
  - Integrated Flight Director (2005)
  - WAAS GPS (2007)
  - Cirrus Perspective by Garmin Integrated Avionics (2008)
  - Synthetic Vision (2008)
  - Infra Red Enhanced Vision (2008)

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What's In a 2012 SR22 That Wasn't In a 2001 SR22?

- Performance and Utility Improvements
  - G2 Fuselage – Reduce Empty Weight (2004)
  - Turbo-normalized Powerplant Option (2006)
  - G3 Wing – Reduced Empty Weight (2007)
  - Increased Fuel Capacity (2007)
  - 3-Blade Composite Prop (2007)
  - Built-In Oxygen (2007)
  - Digital Autopilot (2008)
  - SR22T – Factory Turbocharging (2010)

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What's In a 2012 SR22 That Wasn't In a 2001 SR22?

- **Improve Comfort and Appeal**
  - 6-point Engine Mount (2003)
  - Auto-like Interior with Soft-Touch Material (2004)
  - XM Audio Entertainment (2005)
  - Air Conditioning (2006)
  - Colored Paint Options (2006)
  - X Package – Two Tone Paint (2007)
  - Yaw Damper (2008)
  - X – Edition (2009)
  - Xi Customization (2010)

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2001

2002

Active Traffic Information

Avidyne MFD & EMax

No Hazard Ice Protection

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2003

Centennial: 6 Point Engine Mount, Platinum Engine, New exterior color

Centennial of Flight 1903–2003

Primary Flight Display

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2004

Datalink Weather

Electronic Charts

TAWS-B Terrain Warning
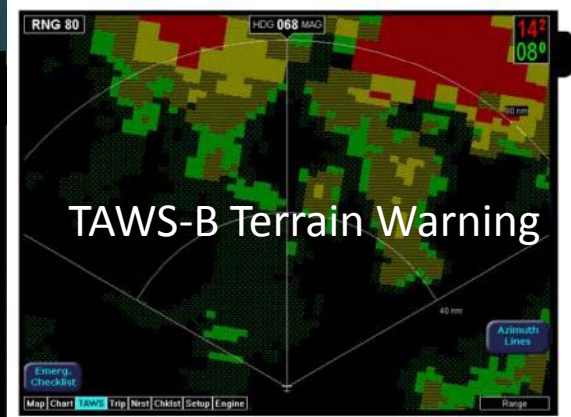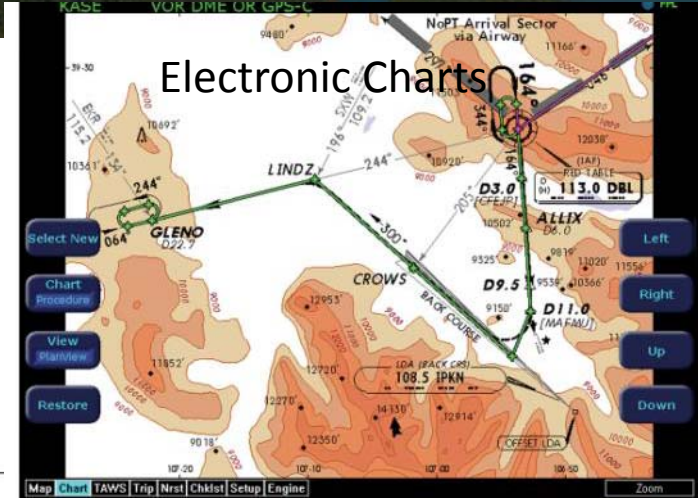
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2005

Airbag Seatbelts

Flight Director

2006

Air Conditioning

Turbo Normalizing

2007

G3 Airframe:

Less Weight
More Fuel
Aesthetic Enhancement
Sterling Paint
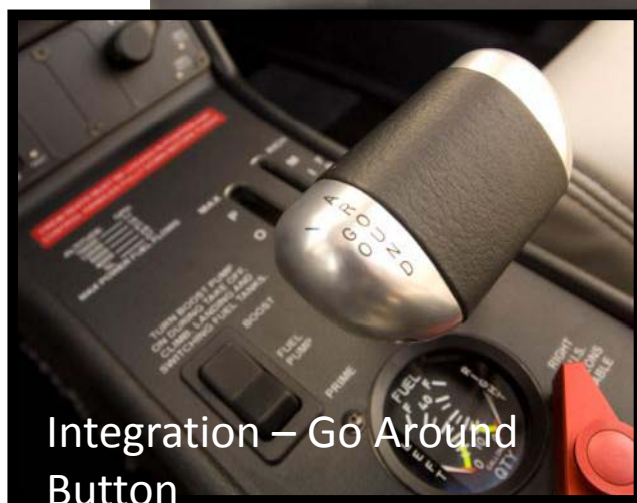
Two Tone Paint Options

Refined Interior

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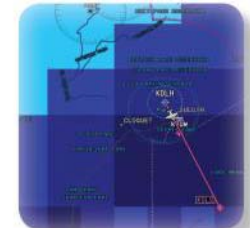# 2008

Synthetic Vision Technology

Enhanced Vision

Integration – Go Around Button

Cirrus Perspective Avionics:

12" Screens
Keyboard Controller
GFC700 Autopilot/Dual AHRS
Blue Level Button
Enhanced Avionics Integration

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2009

Certified Flight Into Known Ice (FIKI) System

X-Edition Luxury Interior/Exterior

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2010
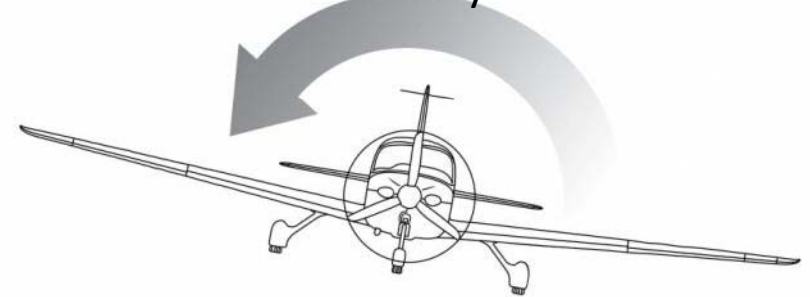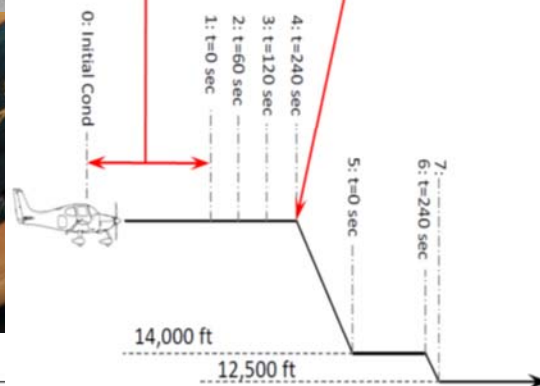
Xi - Customization

ESP – Electronic Stability & Protection

Altitude	X Interval
15,000'	1800 sec (30 min)
18,000'	1200 sec (20 min)
22,000'	600 sec (10 min)
25,000'	300 sec (5 min)
28,000'	60 sec (1 min)

AFCS Status Annunciation

Perspective Software Enhancements:

Autopilot Stall Protection, Autopilot Coupled Go-Around, User Interface Enhancements, etc…

14,000 ft

12,500 ft

Hypoxia Recognition, Automatic Descent Mode

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2011

- 10 Year SR22 Anniversary – 10 limited commemorative edition aircraft
- 5,000 Cirrus – one of a kind aircraft to celebrate
  - Over an estimated 5 million fleet hours accumulated
- Five year spinner to tail warranties

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2012

- Iridium Satellite
  – In cockpit weather, phone, and texting

- Redesigned rear seat
  – Additional occupant
  – Latch child restraint system

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Cirrus Aircraft have more 'built in' safety features as compared to any other aircraft in class

But...

Cirrus pilots continue to have accidents at rates similar to the rest of General Aviation
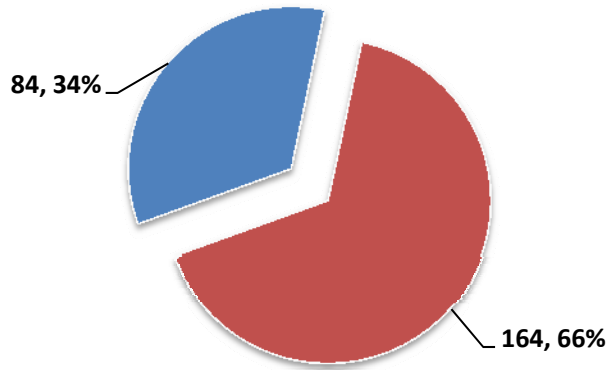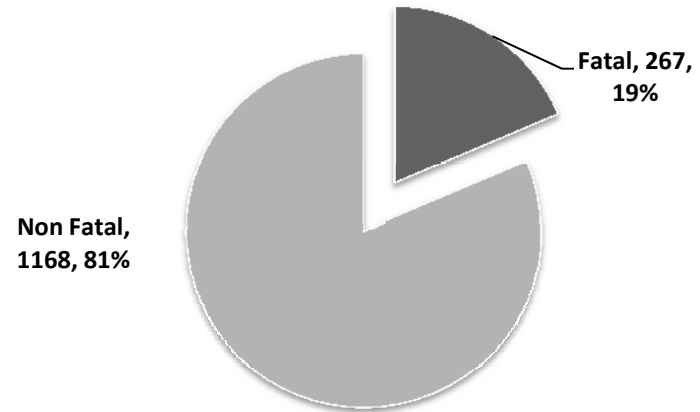
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Fleet Statistics

- Number of aircraft delivered: 5100+
- Estimated number of fleet hours: 5.5M+
- Number of fatal accidents: 84
- Cirrus fatal accident rate: approx 1.5 fatal accidents / 100,000 fleet hours
  - Compare to GA (NTSB), 1.27 fatal accidents / 100,00 flight hours
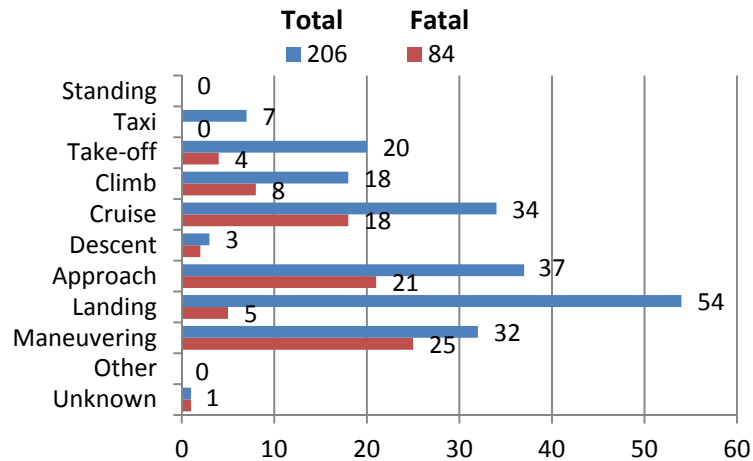- CAPS events: 31, lives saved: 53

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Accident Highlights

CIRRUS FATAL AND NON FATAL ACCIDENTS

84, 34%

164, 66%

GA FATAL AND NON FATAL ACCIDENTS, NTSB

Fatal, 267, 19%

Non Fatal, 1168, 81%

Cirrus Accidents by Phase-of-Flight

Total 206 · Fatal 84

Phase	Total	Fatal
Standing	0	
Taxi	7	0
Take-off	20	4
Climb	18	8
Cruise	34	18
Descent	3	
Approach	37	21
Landing	54	5
Maneuvering	32	25
Other	0	
Unknown	1	

Cirrus Accidents by Probable Cause

Total 206 · Fatal 84

| Cause	Fatal	Total
Loss of Control in Flight	36	60
In-flight Loss of Engine Power	7	27
In-flight Collision with Terrain	13	25
Loss of Control on Ground	0	24
In-flight Encounter with Weather	11	17
In-flight Collision with Object	13	16
Hard Landing	1	15
Airframe Component or System Failure	0	6
Brake Fire	0	5
Unknown/Other	3	4
On-Ground Collision with Object	0	4
Deer Strike	0	3

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Landings and baulked Landings

- 53 Cirrus "Landing" accidents analyzed, *all with NTSB PC*
  - 45% involve an attempted go around
  - 75% made contact with the runway before initiating go around
  - 67% of attempted go around ended up on the left side of the runway
  - Pilot statements in most NTSB reports "the aircraft did…"
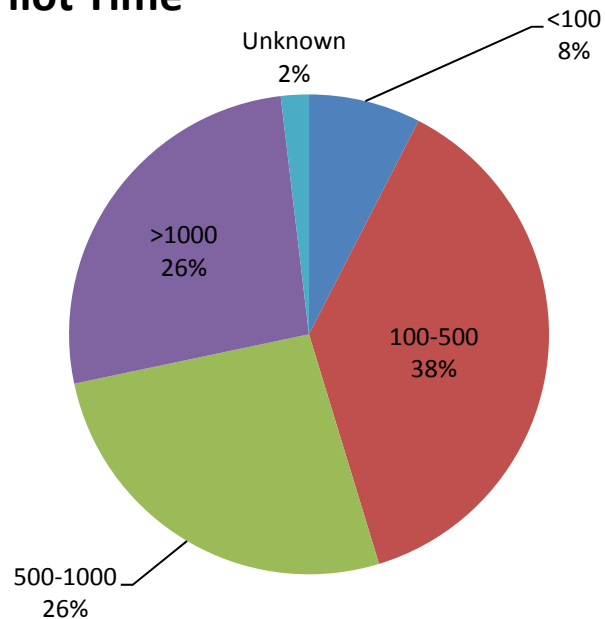
RH Classification
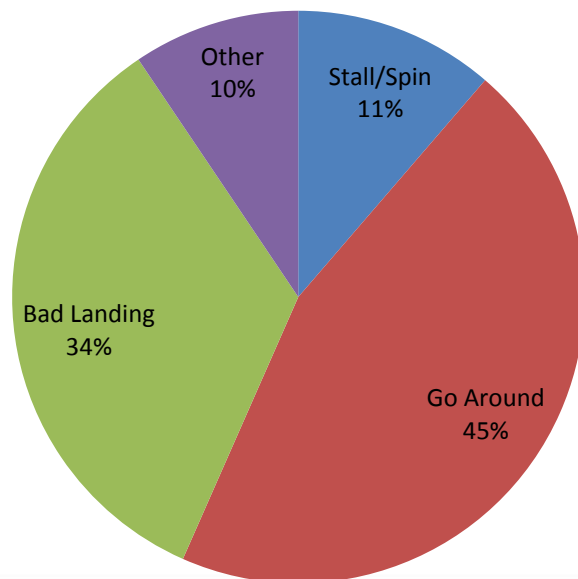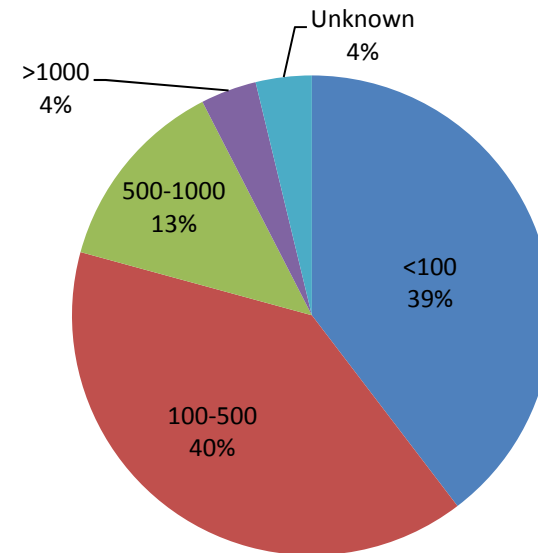
Aircraft Final Resting Place

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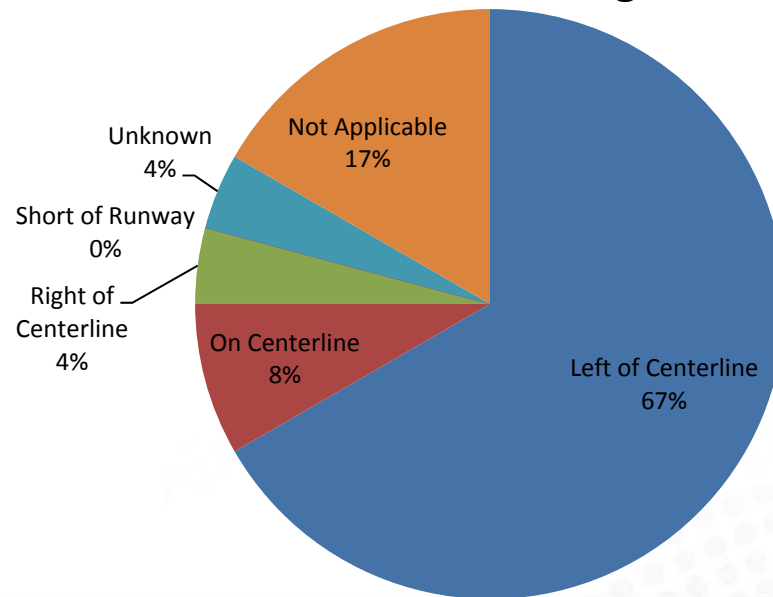
Landing Accidents:
Is this a new pilot problem?

Cirrus Fatal Accidents by Probable Cause
Total Fatal Accidents

■ 84

Probable Cause	Count
Loss of Control in Flight	36
In-flight Collision with Object	13
In-flight Collision with Terrain	13
In-flight Encounter with Weather	11
In-flight Loss of Engine Power	7
Unknown/Other	3
Hard Landing	1
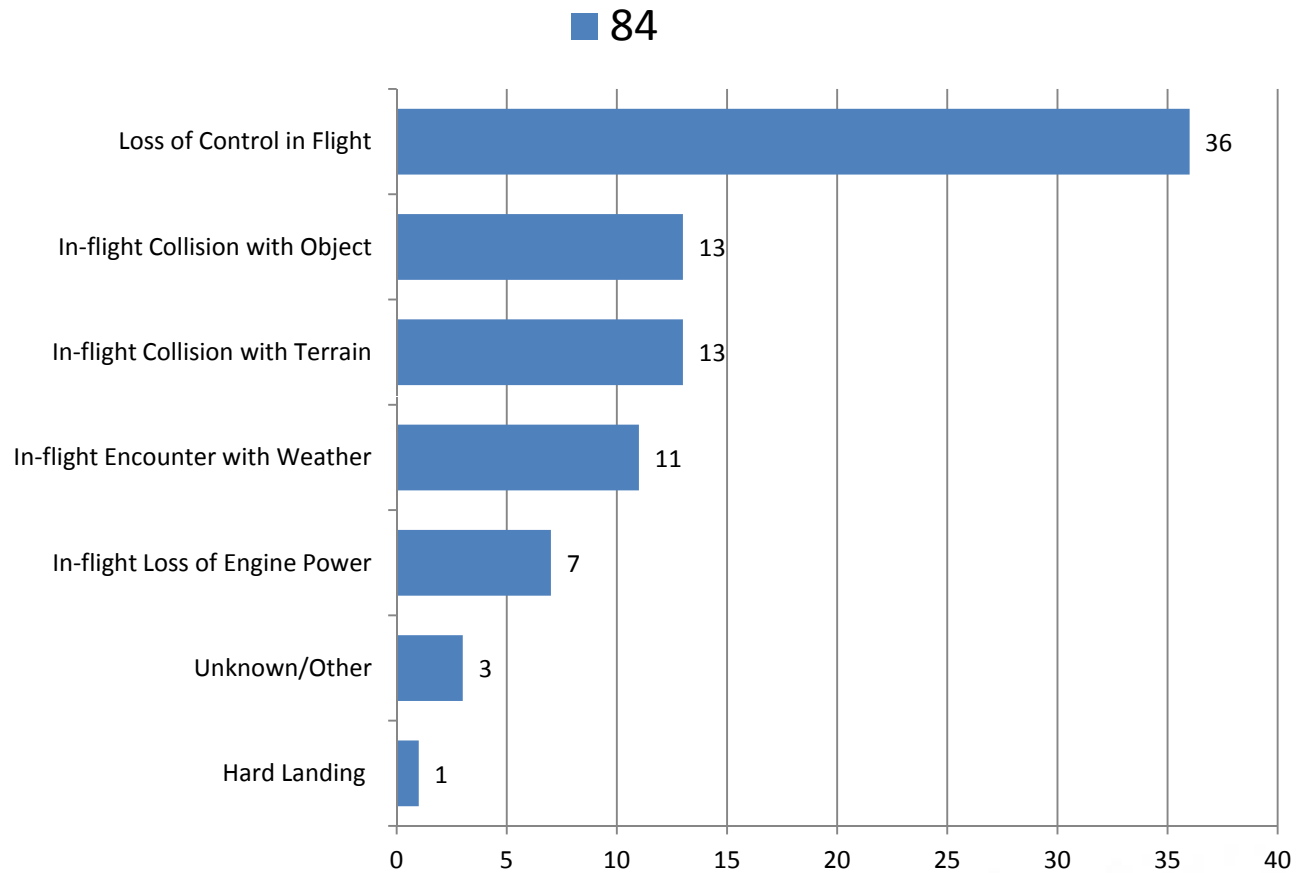
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Fatal Accidents and Weather

Cirrus Fatal Accidents (84)
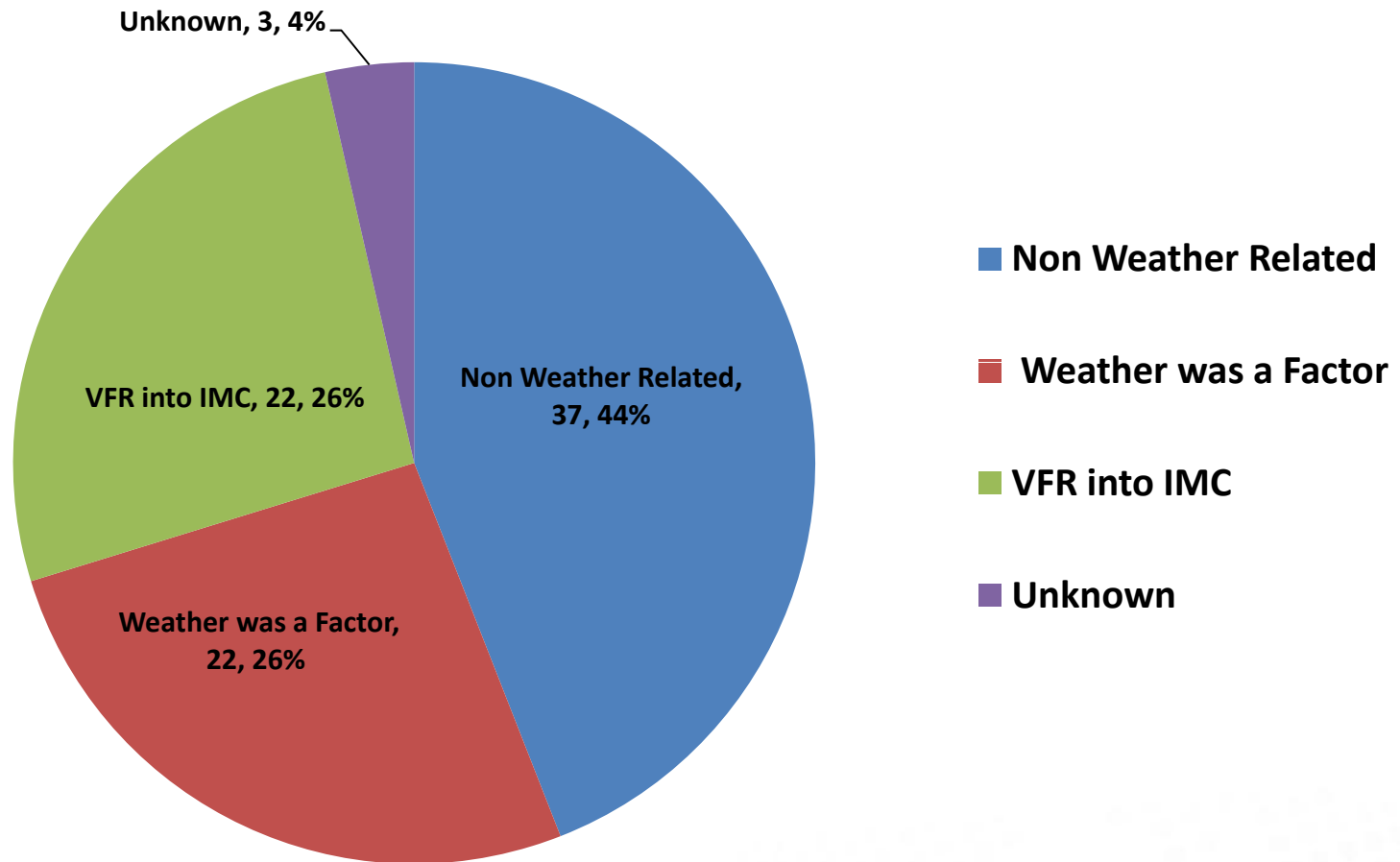
Unknown, 3, 4%

VFR into IMC, 22, 26%

Non Weather Related, 37, 44%

Weather was a Factor, 22, 26%

- Non Weather Related
- Weather was a Factor
- VFR into IMC
- Unknown

Data based upon preliminary information

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VFR into IMC, Fatal Accidents (22)

US, 10, 45%

Europe, 9, 41%

Other, 3, 14%

■ US
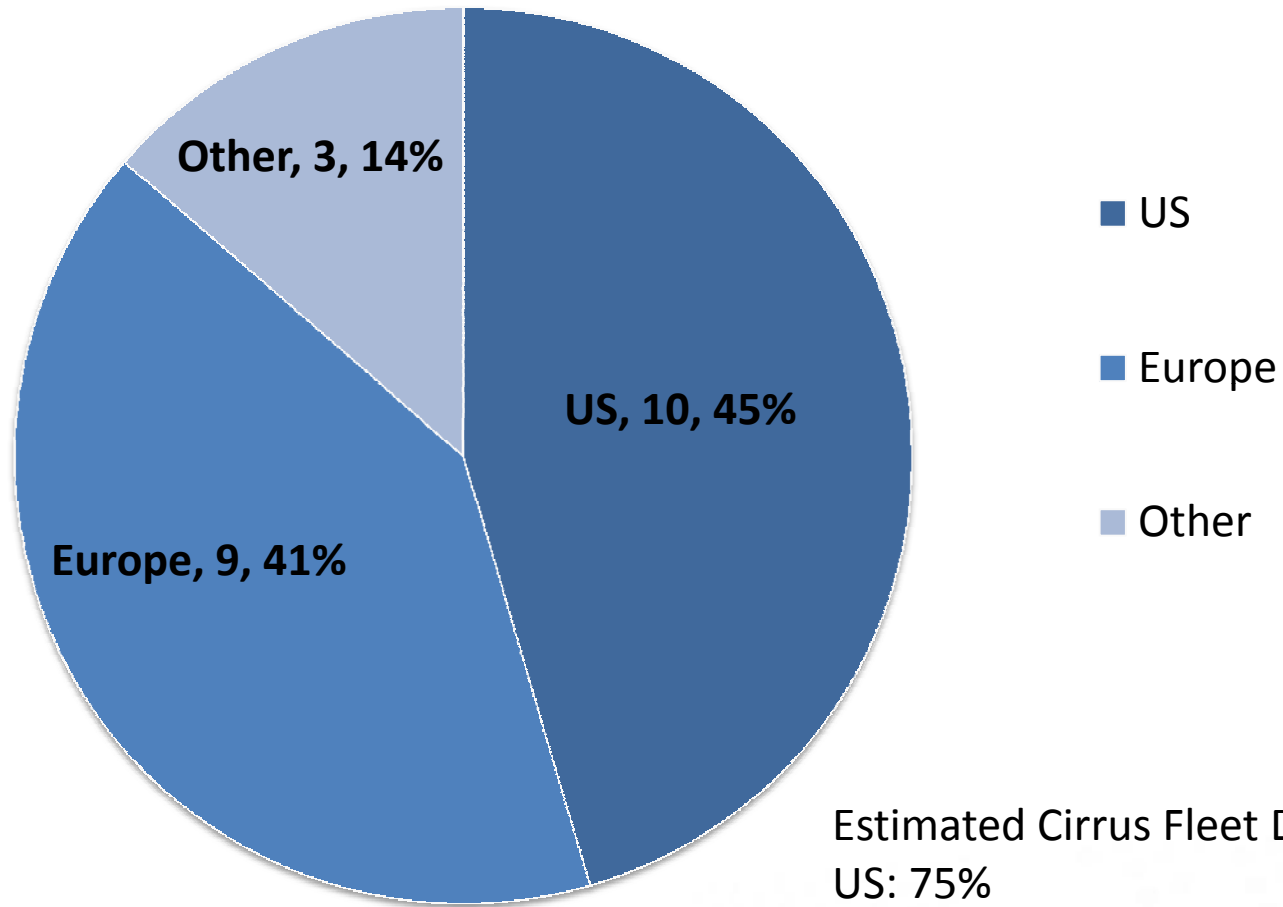
■ Europe

■ Other
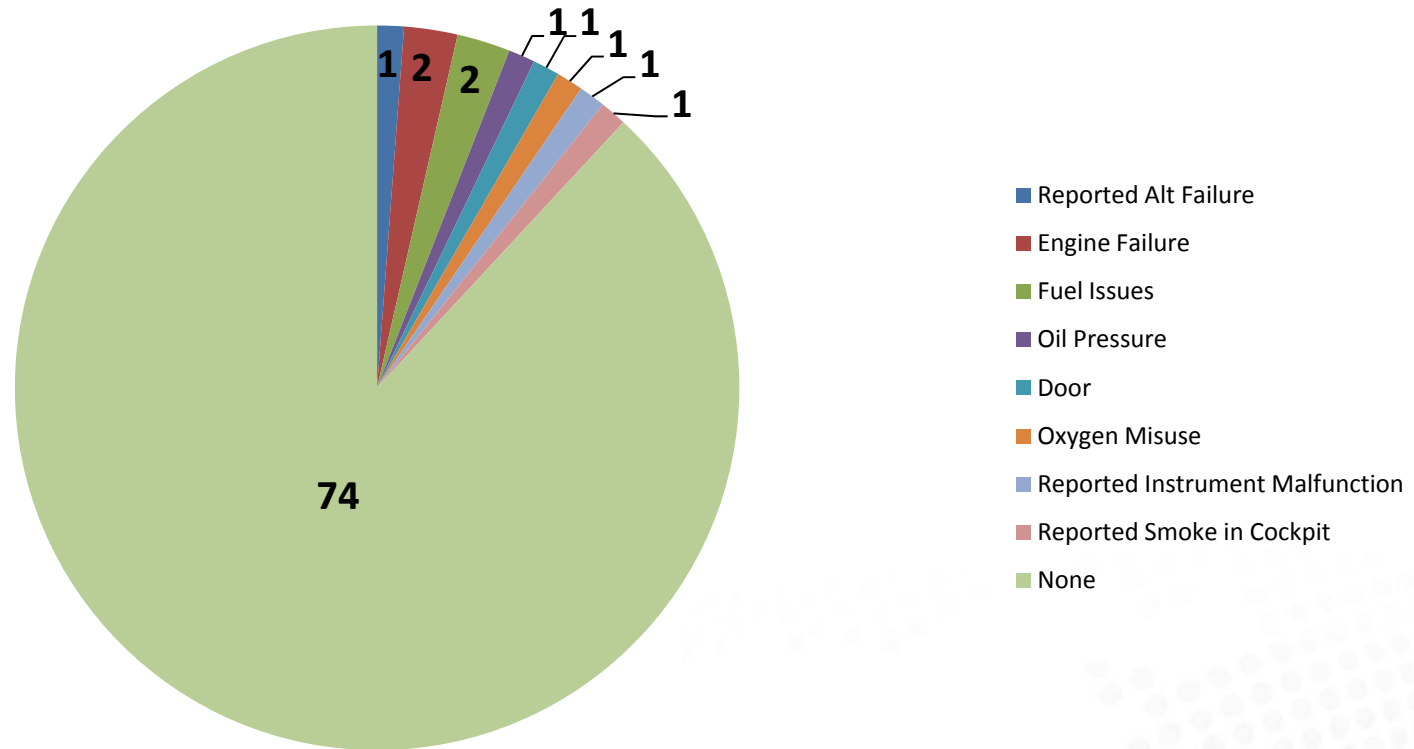
Estimated Cirrus Fleet Distribution
US: 75%
Europe: 15%
Other: 10%

Data based upon preliminary information

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84 FATAL ACCIDENTS

- Could have been 115
- Should be less...

Conclusions

- Initial training focuses on 'aviate, navigate, communicate'. Are we missing a step that maximizes aircraft technology…automate?
- Europe VFR into IMC Fatal accidents
  - Great example of how regulations, cost, and training requirements create a negative behavior
  - What regulations do we have that teach or promote negative behaviors?
- Current technology is good, but pilots still find a way to crash or lose control. How do we leverage technology?
  - Aircraft that don't let the pilot 'lose control'
  - Aircraft that won't run into the ground
  - Aircraft that can land themselves
- RNP, bring available technology to GA class aircraft
  - Efficiency, safety, simplification, expansion of DPs and missed approaches

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Conclusions

- Of all the fatal Cirrus accidents and CAPS pulls, the aircraft was 'flyable' 97 time out of 115 accidents
  - Airframe component or system failure: 3
  - Engine failure: 15 (6 fuel mismanagement)

What technology could have saved or prevented these 97 accidents?

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