Air Show Safety: an Overview

Remarks of

John Cudahy, President International Council of Air Shows to the

National Transportation Safety Board January 10, 2012 Washington, DC

Presentation Overview

- **☐** Industry profile
- □ Industry relationship with FAA
- □ Overview of air show safety program
- □ Safety statistics







Industry Profile

- ☐ \$250 million \$300 million in revenue per year
- □ 10-12 million spectators per year
- ☐ 300-325 air shows annually in U.S.
- □ 278 aerobatically-certified air show pilots
- □ Nearly 10,000 individual performances/year







Air Show Profile

- □ Largely volunteer driven
- □ Extremely site dependent
- □ All shapes and sizes
 - Military and civilian
 - At airports and along waterfronts
 - Large and small
 - New and well-established
- ☐ As small as 3,000 and as large as 350,000 spectators
- □ Safety is primary concern

Non-North American Air Shows

- □ No prohibition on aerobatics directed toward crowd
- ☐ Much smaller separation distances
- ☐ U.K. regulations closest to U.S.
 - Similar philosophy and approach
 - Rigorous pilot evaluation program

Air Show Performer Profile

- Principally current or former airline and military pilots
- Disciplined and highly skilled aviators
- □ Largely part-time
- □ Varied types of aircraft

















International Council of Air Shows

- Non-profit trade association
- □ Industry focal point for 45 years
- ☐ 850+ member organizations
- ☐ Established to help promote air show safety
- □ Administrator of Aerobatic Competency Evaluation (ACE) program for 20 years
- □ Safety receives major commitment of staff time and association resources

Industry Relationship with FAA

- ☐ FAA Order 8900.1, Volume 3, Chapter 6
 - 108 pages, 89 of which address air shows
 - Developed and amended many times with considerable industry input
- ☐ Relationship is collaborative, safety-focused
- ☐ FAA is visible, respected, knowledgeable
- ☐ FAA has monitors at nearly every air show
- ☐ ICAS, FAA are partners on ACE program
- ☐ FAA has been helpful in enabling industry Safety Management System (SMS) efforts

Air Show Safety Program

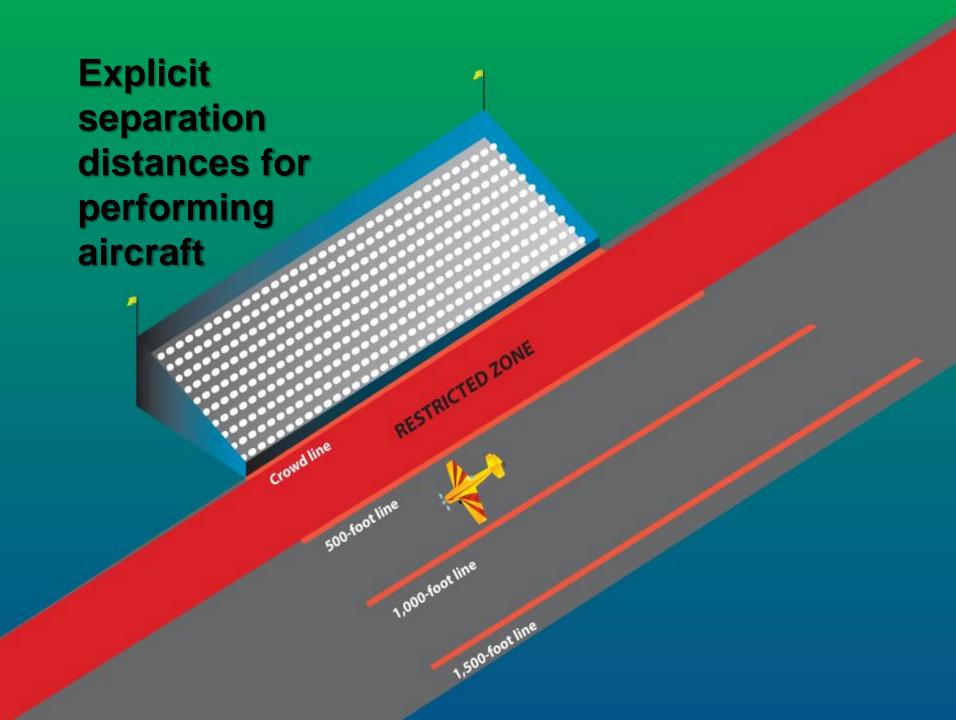
- □ Air show safety program established in 1951 after fatal spectator accident in Colorado
- ☐ Time tested at nearly 20,000 air shows by 600 million spectators over 60 years
- ☐ Principal focus is spectator safety
- □ Four principal components
 - Separation distances
 - Sterile aerobatic box
 - No aerobatic energy directed at crowd
 - Rigorous industry evaluation programs
- ☐ Thorough performer briefing is essential

Air show safety program based on four components

AIR SHOW SAFETY PROGRAM SEPARATION DISTANCE AEROBATIC BOX **ACE PROGRAM** NO ENERGY TOWARD CROWD

Explicit separation distances for performing aircraft

AIR SHOW SAFETY PROGRAM SEPARATION DISTANCE



Aerobatic

Maneuvers

More than 245

knots(282mph)

1500 feet-

(CAT I)

1000 feet- (CAT II)	More than 156 knots but 245 knots or less(181-282 mph) and Helicopters	Aerobatic Maneuvers	
500 feet - (CAT III)	156 Knots or less (180 mph) or gross weight of no more than 2,250 or other aircraft not listed above	Aerobatic Maneuvers	The state of the s
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100 feet	Ultralights, powered parachutes, paragliders	Non- Aerobatic Maneuvers	

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100 feet	Ultralights,	Non-	
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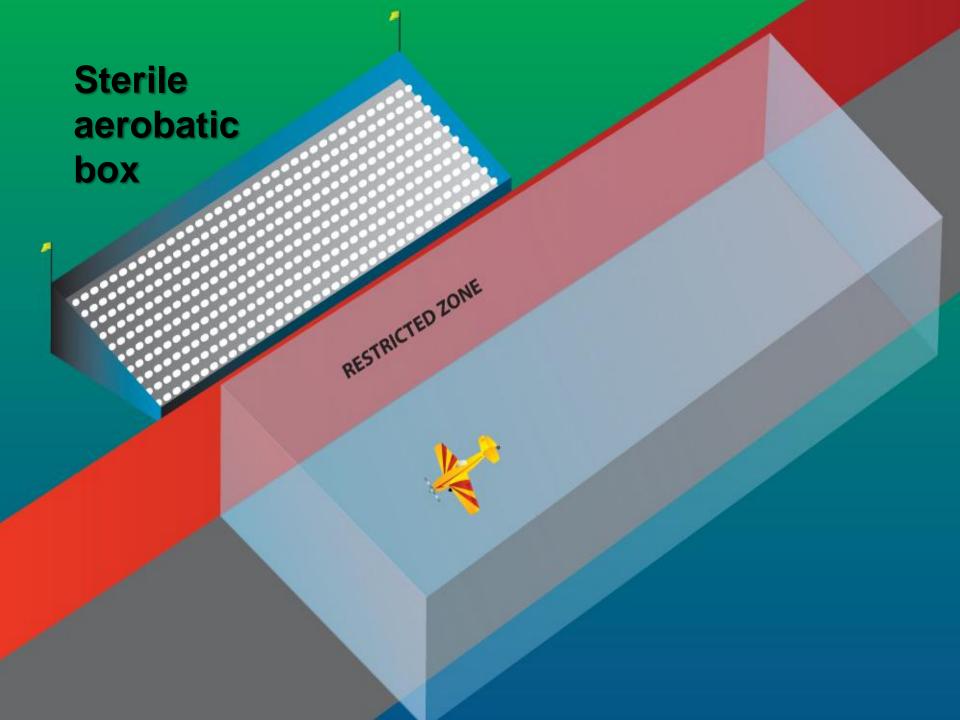






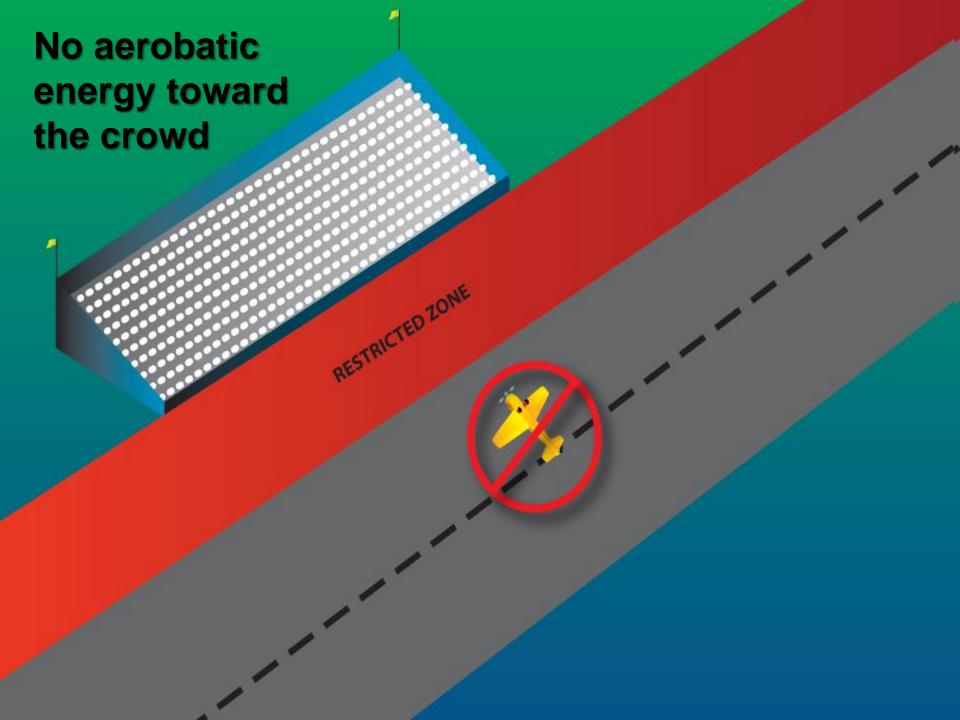
Sterile aerobatic box





No aerobatic energy toward the crowd





Rigorous industry evaluation programs



Rigorous Industry Evaluation Programs

- ☐ Similar to those used by military, air carriers
- □ Aerobatic Competency Evaluation (ACE)
 - O FAA program administered by ICAS and EAA
 - O Peer evaluations once a year <u>AND</u> when moving to new altitude <u>AND</u> when adding a new aircraft
 - O Altitude step-down process
 - ◆ 800 feet
 - 500 feet (after 8 shows at 5 sites)
 - 250 feet (after 12 shows at 6 sites)
 - No restriction (after 16 shows at 8 sites)
- ☐ Formation and Safety Team (FAST)
 - O Demonstrate proficiency, adopt common procedures
 - Ground and flight evaluations required

Does it work?

AIR SHOW SAFETY PROGRAM

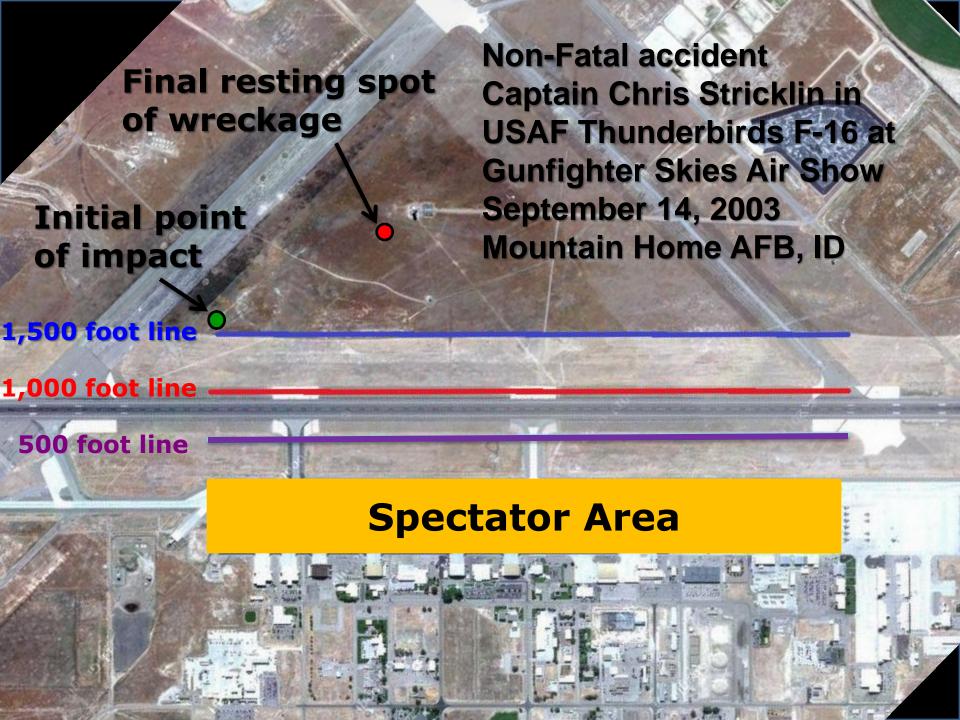
SEPARATION DISTANCE

ACE PROGRAM

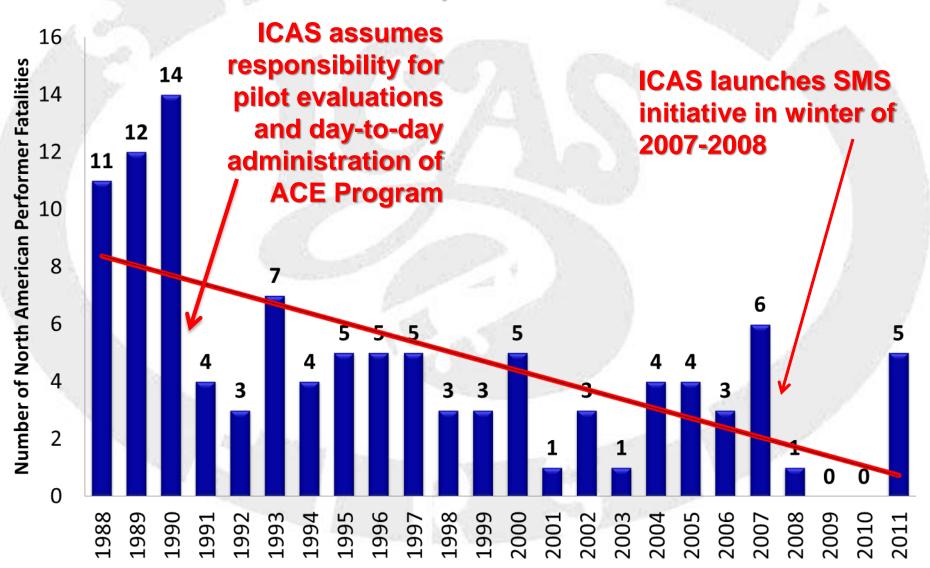
AEROBATIC BOX
NO ENERGY TOWARD CROWD

North American Air Show Spectator Fatalities, 1951-2011





North American Air Show Performer Fatalities, 1988-2011



ICAS Safety Management System Initiative

- "Safety First" industry awareness program
- ☐ Full-time Director of Safety
- Education and training
- **☐** Data generation efforts
 - ICAS Confidential Reporting System
 - ICAS Safety Incident Procedures
- Identifying and mitigating root causes of incidents and accidents

Summary

- □ Closely monitored by federal regulators
- □ Time-tested spectator safety program that has produced superlative spectator safety record
 - O Separation distances
 - No aerobatic energy toward crowd
 - Sterile aerobatic box
 - Rigorous industry evaluation programs
- Industry has routinely and pro-actively addressed safety concerns within air show community
- Industry recently adopted and is implementing Safety
 Management System philosophy and procedures

Questions?