Midair Collision
Between Cessna 150M and
Lockheed Martin F-16CM

Moncks Corner,
South Carolina
July 7, 2015
Accident

- Cessna pilot and passenger fatally injured
- F-16 pilot ejected, minor injury
History of the Flights

- **F-16**
  - Practice approach at CHS
  - IFR
  - Radar and radio contact with ATC

- **Cessna**
  - Departed MKS
  - VFR
  - No ATC contact, not required
Air Traffic Control

- F-16 on radar vectors at 1,600 ft
- Cessna appeared on radar near MKS at indicated altitude of 200 ft
- Airplanes were within 3.5 nm
- Controller issued traffic advisory to F-16
The Collision

[Map showing aircraft collision with speed and altitude details]
Air Traffic Controller

- Thought Cessna would remain in traffic pattern at MKS
- Recognized conflict and issued traffic advisory
- Closure rate of 300 kts
- Tried to separate airplanes visually
- Left few options
ATC Actions and Alternatives

- Instructed F-16 to turn left
  - Flightpath would cross in front of the Cessna
  - Dependent on timely action for success
- Best action would have been to instruct F-16 to turn before airplanes were close and away from Cessna’s path
ATC and F-16 Pilot Actions

• Pilot’s response signified confusion
• Controller expected high performance turn
• “Immediately” held a different meaning for controller and pilot
• Use of clarifying phrase would have removed ambiguity
See and Avoid

- Relies on pilot to identify threats and take action
- Inherent limitations
  - Visual and information processing
  - Competing tasks
  - Limited field of view
  - Environment
See and Avoid - Environment

- Low traffic density
- Visual meteorological conditions
- Cessna
  - Transponder and single communication radio
  - No traffic display or alert technology
  - Was not in contact with ATC
See and Avoid - Environment

- F-16
  - See and avoid with ATC traffic advisories
  - Tactical radar system did not detect Cessna
  - Also did not have in-cockpit traffic display or alert technologies
• Small, stationary, or slow-moving objects
• Both pilots would have had difficulty detecting other airplane
WEST death four one traffic twelve o'clock two miles opposite direction one thousand two hundred indicated type unknown
Probable Cause

The approach controller’s failure to provide an appropriate resolution to the conflict between the F-16 and the Cessna. Contributing to the accident were the inherent limitations of the see-and-avoid concept, resulting in both pilots’ inability to take evasive action in time to avert the collision.
Safety Issues

• Air traffic controller judgment
• Collision avoidance technologies