Breaking the Accident Chain

Helitech International 2013
Safety Workshops
26 September 2013
Agenda

• CFIT Truths and Myths
• Breaking the Accident Chain Overview
  – FAA Case Scenario
• HTAWS Truths and Myths
• HTAWS – What you need to know
• Mandate Update
Good judgment comes from experience. Unfortunately, experience usually comes from bad judgment.

**Myths**
- Only happens at night
- Only happens in low visibility conditions
- NVIS is all I need
- It can’t happen to me
- Only happens when problem with aircraft

**Truths**
- 50% of CFIT incidents occur in Day VFR Conditions
- Incidents involve both CFIT and Wires
- NVG’s certainly increase safety but does not alert to hazards
CFIT to Environmental Conditions

- Not CFIT: Clear, Low Visibility
- CFIT/Obstacle: Clear, Low Visibility
- CFIT/Terrain: Clear, Low Visibility

Chart showing percentages of accidents under different conditions.
Relationship of CFIT
Fatal vs. Non-Fatal Accidents

![Graph showing relationship between CFIT and fatal vs. non-fatal accidents.](image)
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NTSB Accident Number: NYC05MA039
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Mission: HEMS repositioning flight
Departure point: Washington Hospital Center Helipad (DC08) – Washington DC
Destination: Stafford Regional Airport (RMN)
Stafford, VA
Flight distance: 38 NM
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Weather at the accident site (DCA Automated Weather Observation):
Winds calm, Visibility 10NM, Broken clouds at 13,000’ and 20,000’, Temperature 45°F, Dew point 36°F, Altimeter 30.25

Moon Illumination: None
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Pilot Information: Commercial Pilot – ASEL, AMEL, Rotorcraft Helicopter, Instrument Helicopter
Medical: Current, Second Class
Pilot Experience: 1500 hours total time
42 hours in the last 90 days
12 hours in the last 30 days
1 hour in the last 24 hours
71 night landings total
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Aircraft: Eurocopter EC-135 P2
AFTT: 166.6 Hours
Maintained IAW FAA approved aircraft inspection program.
This aircraft was being flown with a properly deferred inoperative radar altimeter.
Departed DC08 @ 2304
Followed Helicopter Route 1 along the Anacostia River to Helicopter Route 4 and then flew south along the Potomac River.
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POINT A

“Washington tower traffic on a ten mile final is an Airbus”
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HTAWS with Traffic Display
“Roger, we have him in sight and will be out of his way”
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POINT C

FATAL DESCENT
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POINT D

IMPACT
Benefits of HTAWS

Increase Situational Awareness by:

• Provides a display showing surrounding terrain, airports.
• Provides a display of obstacles (not all HTAWS display transmission lines).
• Provides a display of nearby traffic.
• Provides altitude awareness through the use of altitude callouts and GPWS alerts.
Summary:
The best trained pilot can’t see everything. HTAWS contributes to situational awareness by helping the pilot to avoid dangers he may not see when he looks outside.
HTAWS

Issues
• Nuisance Alerts
• Certification sign off
• Ease of Installation
• Liability of waiting

Myths
• All HTAWS are the same
• Class A vs. Class B

Options/Features
• Wire Database
• RadAlt Display
• Traffic Display
• Flight Plan Display
• NVIS
• 3 arc sec vs. 6 arc sec data
Questions to ask before purchasing HTAWS.

• Is the HTAWS, TSO C194 compliant?
• How does the system technically deal with nuisance alerts?
• Does the system have a wire database (transmission lines and towers)?
• What is required to install a solution and get it signed off/certified? STC, AML STC? No Field Approvals are authorized.
• What companies/operators/OEMs have installed the system, and what have the results been?
Certified HTAWS Options
Improving Safety in HEMS Operations

- Within Notice 8000.293, the FAA recommends, and HAI endorses, the following actions be taken by industry to enhance safety for air medical operations:
  - Terrain awareness warning systems (TAWS)
  - Radar altimeters
  - Night vision enhancement systems
- Night vision systems are proven tools that would significantly reduce the risk of controlled flight into terrain (CFIT) accidents.
- In 5 of the 6 accidents, the aircraft were operating in VMC conditions; only one was operating in reported IMC, and that aircraft was operating under VFR rather than IFR. These accidents might have been averted had the aircraft been equipped with TAWS and/or night vision systems.

**TSO – 2012 Proposed FAA Changes**

- Ground Proximity Warning/Glide slope deviation Alerting Equipment.

- False Alert: A warning or caution that occurs when the designed terrain or obstacle warning or caution threshold of the system is not exceeded.

- Nuisance Alert: An alert that occurs when there is no threat or is unnecessary for the intended operation.

- Applicants should consider providing a mode that will account for off-airfield operations that will still provide the pilot with essential alerts regarding terrain without nuisance alerts. Without a reduced protection or similar mode, nuisance alerts may lead to pilots ignoring or inhibiting the HTAWS at inappropriate times.
TSO – 2012 Proposed FAA Changes

- Located in pilots’ primary field of view
- Compatibility evaluation of HTAWS equipment lighting with previous night vision imaging system (NVIS) lighting modifications and night vision goggle (NVG) compatibility.
- Operations into off-airfield locations should not trigger nuisance alerts
- The status of the inclusion of power lines in the obstacle database is currently under review since upwards of 50% of CFIT involves wires. Ask.
Mandate Timeline

Since 2003 there have been an average 12 fatal HEMS accidents per year—or 1 fatal accident every month.¹

**2003**

- **FEBRUARY 2006**
  - The NTSB issued Safety Recommendation A-06-15, which asked the FAA to do the following:
    - Require [EMS] operators to install [TAWS] on their aircraft
    - In response, the FAA indicated that, before it could require that HEMS be equipped with TAWS, a technical standard order (TSO) was needed to specify an acceptable TAWS for helicopters

- **DECEMBER 2008**
  - TSO-C194 HATAWS Published

- **SEPTEMBER 2008**
  - Before the House Committee of Transportation and Infrastructure, FAA Director of Flight Standards, John Allen, announced that the agency had initiated the formal rulemaking process that would address several key industry best practices—including HTAWS—to raise the bar on helicopter safety.²

**2009**

- **APRIL 2009**
  - FAA released draft guidance outlining the technical requirements for a widely expected mandate that will require the installation of terrain awareness and warning systems (TAWS) on all helicopter EMS (HEMS) aircraft.

**2013**

- **MARCH 2013**
  - 3 year compliance period to end (estimated).³

**2016**

- **MARCH 2016**
  - FAA mandate publication date (estimated).³

- **2016**
  - International Helicopter Safety Team (IHST) goal to reduce the worldwide helicopter accident rate by 80% in 10 years.⁴

See what's next