



**National  
Transportation  
Safety Board**

# Improving Safety of Public Use Helicopter HEMS/SAR Operations: Can NASAO Help?

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# Outline

- NTSB 101
- Challenges of HEMS/SAR
- Accidents in Three States
- Improvements in Those Three States
- NASAO Role in Helping Remaining States Learn from Those States' Accidents?

# NTSB 101

- Independent federal agency, investigate transportation mishaps, all modes
- Determine probable cause(s) and make recommendations to prevent recurrences
- Primary product: Safety recommendations
  - Favorable response > 80%
- ***SINGLE FOCUS IS SAFETY***

# NTSB Characteristics

- Independence
  - Political: Findings and recommendations based upon evidence rather than politics
  - Functional: No “dog in the fight”
- Transparency
  - Enables public to know facts on which NTSB conclusions and recommendations are based

# Safety Improvement Challenge

- HEMS/SAR missions are invaluable, thousands of lives saved
- HEMS/SAR missions often involve very difficult circumstances, need to balance safety concerns against mission completion objective
- Since 2004, more than 130 accidents involving federal, state, and local public helicopter operations (not all HEMS or SAR)
- Public helicopter operations included on NTSB's 2015 Most Wanted List of transportation safety improvements

# Challenge (con't)

- Many improvements implemented by a state after it has an accident
- Subsequent accidents in other states in similar difficult circumstances
- No federal regulatory oversight, so no global fixes
- How to get states to implement improvements based upon accidents of other states rather than only from their own?
- Can NASAO help?

# Recent Examples

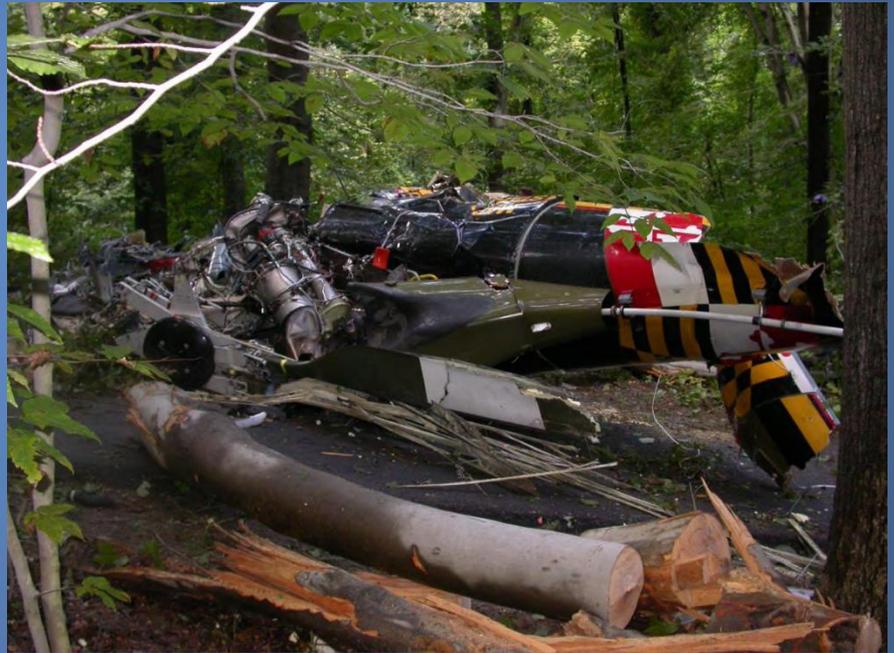
- Maryland State Police (2008)
- New Mexico State Police (2009)
- Alaska State Troopers (2013)

# Chronology of Relevant Events

- 2005: International Helicopter Safety Team (IHST) created
  - Needed to address unacceptable accident rate
  - Largely HEMS accidents
- 2006: NTSB Special Investigation Report re HEMS
- 2008: Maryland State Police Accident
- 2009: NTSB public hearing re HEMS accidents
- 2009: New Mexico State Police Accident
- 2011: NTBS Public Aircraft Forum
- 2013: Alaska State Trooper Accident
- 20\_\_ : Next public use aviation accident?

# Trooper 2 Crash, Sept. 27, 2008

- Operated by MD State Police
- Medevac Flight
- Crashed into trees/terrain 3.2 miles short of Andrews Air Force Base (ADW) during instrument approach



# Probable Cause

- Pilot's attempt to regain visual conditions by performing a rapid descent and his failure to arrest the descent at the minimum descent altitude during a nonprecision approach
- Contributing factors:
  - Pilot's limited recent instrument flight experience
  - MSP did not adhere to effective risk management procedures
  - Pilot's inadequate assessment of the weather, which led to his decision to accept the flight
  - Air Traffic Control issues

# Decision to Accept the Mission

- Duty officer left the decision to the pilot
- Pilot hesitant to accept the mission; Weather conditions close to MSP minimums; MSP flying on a “flight-by-flight” basis statewide
- Pilot possibly influenced by report of an inter-hospital medevac transfer in the same area – “If they can do it, we can do it”
- Pilot accepted mission with inadequate assessment of the weather
- No formal risk assessment procedures

# MSP's Aggressive Post-Accident Actions

- Designed new mission-specific flight risk assessment tool that quantifies accident risk; notifies flight crew if category is “red”
- Implemented new instrument currency requirements similar to those dropped in 2007
- New requirements for duty officers to be certified flight communicators
- Duty officer evaluates weather prior to flight, can make a no-go decision before flight crew is notified

# NTSB Recommendations to All Public HEMS Operators

- Develop/implement flight risk evaluation programs
- Formalized dispatch and flight-following procedures
- Use most up-to-date weather
- Install TAWS and train flight crews to use it

# Recommendations to MSP

- Screen/treat pilots for OSA
- Revise policy for missing/overdue aircraft so that an aviation command trooper will be the incident commander
- Additional training to dispatchers on the use of cell phone pinging in SAR

# HEMS Public Hearing, 2009

- Result of nine fatal HEMS accidents in 12 months
- Follow-up to 2006 Special Investigation Report, with four recommendations to FAA
- Learned more about the industry in order to get at the problem more effectively . . . because states were not learning from each other

# June 9, 2009, Santa Fe, NM



- New Mexico State Police (NMSP)
- Rescue of a missing hiker
- Rescue delay, pilot fatigue, because pilot had to find injured hiker, carry her to helicopter
- Pilot and passenger killed; spotter seriously injured

# Probable Cause

- Pilot's decision to take off from a remote, mountainous landing site in dark (moonless) night, windy, instrument meteorological conditions
- Contributing factors:
  - Organizational culture prioritized mission execution over safety
  - Pilot's fatigue, self-induced pressure, situational stress
  - No requirement for a mission risk assessment
  - Inadequate pilot staffing
  - No effective pilot fatigue management program
  - Inadequate procedures and equipment to ensure effective air-ground communication during search and rescue missions

# A Few Of NMSP's Aggressive Post-Accident Actions...

- Improved flight authorization procedures to ensure that shift supervisor on duty receives all relevant info before dispatching flight crew
- Developed a mission risk management worksheet that addressed factors such as type/complexity of mission, planning time and guidance available, crew selection, and environmental conditions
  - Included weather briefing and crew rest, among other factors

# NTSB Recommendations to the Governor of New Mexico

- Bring NM DPS policies/operations into conformance with industry standards (e.g. ALEA)
- Require NM DPS to develop/implement fatigue management program with protected rest periods and pilot staffing consistent with rest requirements
- Revise or reinforce NMSP SAR policies to ensure direct communications between air and ground SAR units

# NTSB Recommendations to NASAO

- Encourage members to conduct an independent review of policies/procedures for conformance to industry safety standards, e.g., ALEA guidance
- Encourage members to develop and implement risk assessment and management procedures specific to their operations
- Encourage members to install 406-mhz emergency locator transmitters
- Encourage members to install flight tracking equipment on all public aircraft to enable near-continuous flight tracking
- To its credit, NASAO responded favorably to all of these recommendations

# Talkeetna, Alaska, March 30, 2013



- SAR mission to rescue stranded snowmobiler
- Alaska Department of Public Safety helicopter not instrument certificated or equipped
- Probably encountered instrument meteorological conditions shortly after beginning accident flight
- Pilot lost control, crashed

# Probable Cause

- Pilot's decision to continue flight under VFR in deteriorating weather, resulting in spatial disorientation and loss of control
- Alaska DPS's punitive culture, inadequate safety management, which prevented identification and correction of deficiencies in risk management and training
- Contributing: Pilot's exceptionally high motivation, which increased his risk tolerance and adversely affected his decision-making

# Decision to Accept Mission

- No evidence that DPS managers pressured pilot to accept missions
- According to his spouse, pilot “checks the weather,” departs for Ted Stevens Anchorage International Airport (ANC)
  - If he checked typical sources, he should have concluded that this flight would take him into IMC
- Pilot motivated to accept mission by:
  - Desire to help others
  - Public recognition, reward for rescues
  - Pay structure that included significant income from on-call and overtime work

# Once Again, Aggressive Post-Accident Actions (by Alaska DPS)

<p><b>Flight Operations</b></p> <p>Inadvertent IMC training for pilots NVG operations suspended until formal training implemented Flight and duty time: emergency exceptions require approval Pilots to adhere to personal/deparment weather minimums</p>	<p><b>Operational Control</b></p> <p>Safety officer reviews Appareo data monthly Clear chain of command Formal risk assessments Flight-tracking in 32 of 42 aircraft (plans were for all aircraft)</p>
<p><b>Organizational Culture</b></p> <p>Chain of command changes Safety officer audits flight/duty time, can act on safety-related findings Safety manager position SMS, including “just culture” 3<sup>rd</sup>-party maintenance audit (other audits were planned or underway)</p>	<p><b>Maintenance</b></p> <p>Appareo system installation now includes audio recording Department reviewing options to address findings from maint. Audit New oversight responsibilities/roles being established</p>

# NTSB Recommendations to Alaska, Other States

- Develop/implement flight risk evaluation program
- Use formalized dispatch and flight-following with up-to-date weather and assistance with flight risk assessment
- Provide formal annual NVG ground/flight training to those pilots who will fly NVG operations
- Require annual simulator training in recognizing, avoiding, and escaping inadvertent IMC encounters
- Create formal tactical flight officer training program
- Develop and implement comprehensive SMS
- Conduct independent audit of SMS every three years
- About 1/3 of the states have responded – favorably and even beyond – but we have not yet heard from the others

# The Pattern: Difficult HEMS and SAR Mission Conditions

- Time of the essence
- Dispatch decision often by pilot
- Pilot fatigue
- Weather bad and locally unreported
- Culture of mission completion over safety
- Frequently night
- Landing in unfamiliar, unprepared, unlit areas
- Inadequate flight dispatch oversight
- Inadequate risk management
- Inadequate training for IMC
- Often no Night Vision Goggles

# Conclusions

- Troubling thread of common issues across several accidents
- Each state took aggressive action after its accident
- These accidents suggest inadequate attention to accidents in other states
- NASAO members could help their states implement improvements without having to have their own accident

# Thank You!!



## Questions?

NTSB Point of Contact for Questions re Public Use Aircraft:  
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