

Air Medical Weather Symposium

Boulder, Colorado
March 21-23, 2006



"Needs of the Air Medical Industry"

Bruce Milton, Air Methods Corporation

Skip Barthle, LifeNet, Inc.

Absolute Safety???

*"A ship in harbor is safe, but that
is not what ships are for."*

John A. Shedd





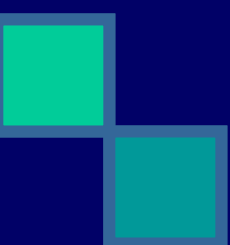

*Enhancing the Safety of Air
Medical Operations*

“Operational Fixes”






Three Primary Resources

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- Human Resources (decision making)
 - Hardware (aircraft)
 - Information Transfer (enhancing weather availability)
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Does weather cause aircraft accidents?

Poor decisions, both individual and group, to fly into bad weather causes accidents!!!



EVERY TEAM MEMBER HAS THE SAME GOAL...TO PERFORM OUR INDIVIDUAL JOB TO THE BEST OF OUR ABILITY AND TO COME HOME SAFELY.

Human Factors

- Definition:

- *Human factors is a multidisciplinary effort to generate and compile information about human capabilities and limitations and apply that information to every area within the air medical environment for safe and efficient integration of the human-machine interface.*



PREVENTING WX ACCIDENTS:

(NTSB ID: FTW00FA091)




During dark night conditions, the helicopter was en route from its hospital base to another hospital to pick up a medical patient for transport back to the base hospital, when the pilot landed the helicopter 15 miles south of the destination hospital due to fog. The patient was transported via ambulance to the helicopter.

After the patient was transferred to the helicopter, witnesses reported that the helicopter departed, with its lights on, and headed toward the south at an altitude between 10 and 75 feet agl. They reported the visibility as poor, about 1/4 mile, a very low ceiling, and extremely dense fog. One witness stated that it appeared as if the helicopter was 'trying to stay close to the ground and not get up into the heavy fog. Examination of the accident site revealed that the helicopter impacted in a near 45 degree nose low attitude and the wreckage encompassed an area measuring 262 feet by 75 feet. A weather study revealed that the accident site was in area of low ceilings and fog, which was expanding to the south and west. According to documents provided by the operator, the pilot had accumulated a total of 44 simulated instrument flight hours and 1 hour of actual instrument flight experience. Examination of the helicopter revealed no evidence of an in-flight control or system malfunction, and examination of the engines revealed evidence of operation at the time of impact.




Weather Decision Making

- Interpreting current and future weather products using the cognitive strategies and processes through...
 - Air Medical Resource Management (AMRM);
 - Uncompromising System Safety Culture;
 - High quality flight, ground, crew member, and communications specialist training.
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AMRM

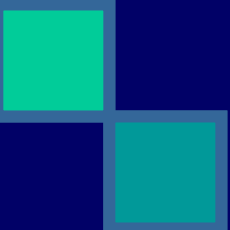

FAA AC 00-64

- AMRM addresses the challenge of optimizing the human/machine interface and related interpersonal issues, with maximum focus on communication skills and team building curricula.
 - This allows the entire team to verbalize their "*right*" to seek and provide accurate information with respect to bringing forth hazards that may arise prior to and during flight operations. *Poor weather is one of those hazards.*
 - All personnel levels of the organization should be mandated to attend initial and annual recurrent AMRM training.
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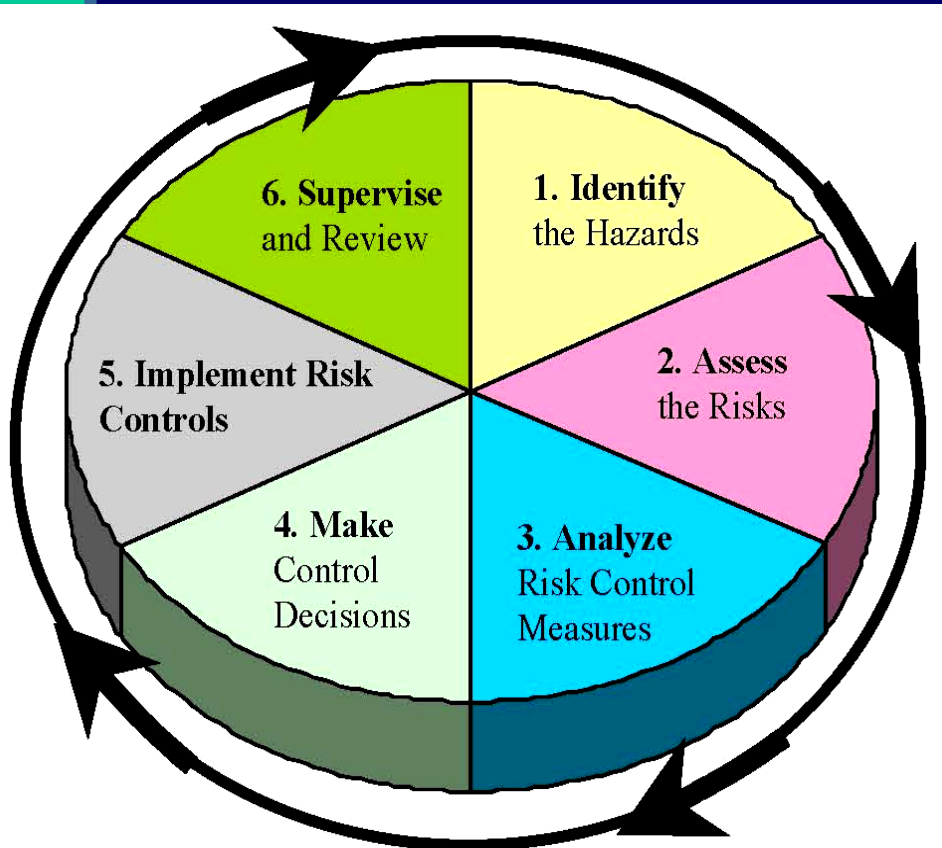
System Safety Culture...

Not Just Another Safety Program

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- System safety is a specialty within system engineering that supports *program risk management.*
 - The goal of System Safety is to optimize safety by the identification of safety related risks, eliminating or controlling them by design and/or procedures, based on acceptable system safety precedence.
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System Safety Flow


Enhancing Air Medical Safety



- **Identify** the hazards (real or potential): *Physical, environmental, or human.*
- **Assess** the risks (probability and severity): *Weather combined with poor decision making increases risk.*
- **Analyze** (reduce, mitigate, eliminate): *Do we have protections in place for the crew to reject?*
- **Make** (control): *An **informed** decision...Not based upon competition between programs or individuals.*
- **Implement** risk controls (management plan): *Does the crew have the ability to apply the controls set in place by management?*
- **Supervise and review** (management and teams): *Management and teams at every level must insure the controls are adequate to enhance good decision making.*




Considerations in Enhancing Weather Judgment


- Pilots should be trained at 6 & 12 month intervals. Serious consideration should be given to maintaining instrument currency, even in VFR only programs.
 - *To provide continuity of the training and evaluation sessions, pilot ground, flight training, and evaluation needs to be uninterrupted.*
 - *Scenario based and LOFT is most effective.*
 - Medical personnel should be trained and evaluated to perform the functions (as appropriate) of a Certificate Holder FAA Crew Member.
 - Communication specialists should be provided formal FAA dispatcher training, as appropriate, initially and with recurrent frequency.
 - Take-off times should be defined as “Commensurate with safe operations” rather than a finite value.
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Aircraft Hardware




Do we have the right equipment to make decisions using available weather products?


- *VFR vs. IFR?*
 - *IFR vs. NVG?*
 - *NVG + IFR?*
 - *EVS?*
 - *Terrain Avoidance Warning Systems?*
 - *Radar Altimeters?*
 - *Multi-Function Displays with Weather?*
 - *Moving Map?*
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Can we become “Task Saturated” by having too much information???



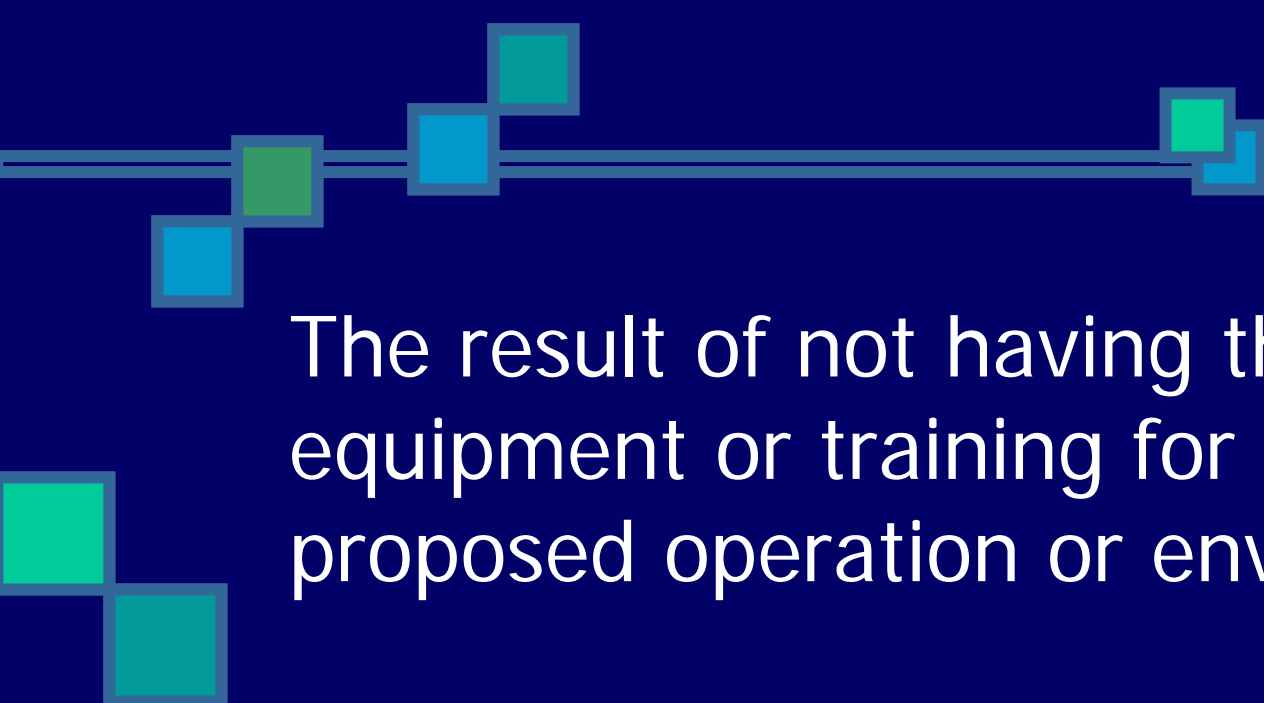
Should all aircraft be equipped with the newest technology, regardless of the operation???



Appropriate equipment must be available for use for the environment and the type of operation.

Reality...





The result of not having the proper equipment or training for the proposed operation or environment...



Minimum Equipment for VFR



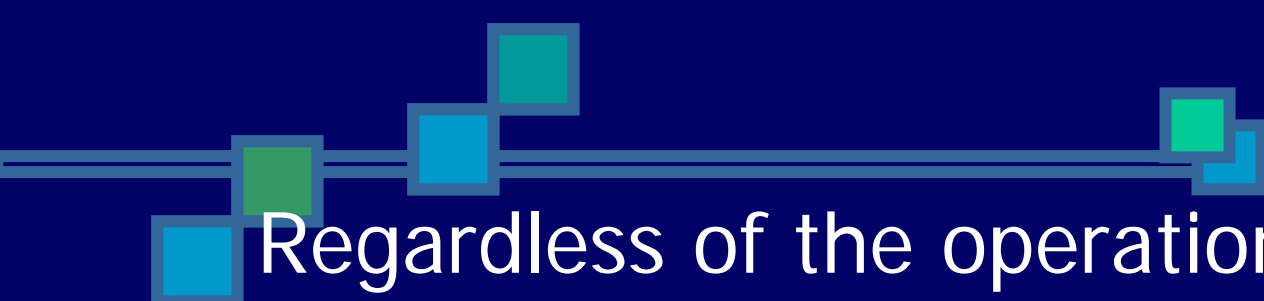
Basic “Legal” Equipment?




or

Equipment Pilots
Actually Feel
Confident & Comfortable
Utilizing When IIMC?





Regardless of the operation, the following will enhance situational awareness using currently available weather products...

- Radar Altimeter-Should be mandatory for night operations
 - Multi-Function Displays
 - Ability to download weather data (commercial vendor)
 - Integrated Avionics
 - TAWS
 - NVG/Synthetic Vision Systems/EVS
- 



*Information Transfer
&
Regulatory Change*

How do we get the weather information to the flight crews???


Yeah, we just don't understand you!!!

"Can you hear me, now???"






...Integrating the Communications Specialist...

- Communications specialist should be trained and checked in some manner paralleling FAA dispatcher requirements, as appropriate for air medical operations.
 - This includes the ability to locate, decode, understand, and verbally transfer weather and other pertinent information to the crews in flight.
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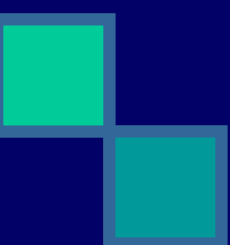



Typically Used Weather Products for Air Medical OPS

- METAR
 - TAF
 - Area Forecast
 - Personal Observation
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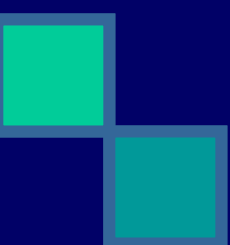



Availability of Weather Reporting

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- Definite need for enhanced AWOS/ASOS at uncontrolled airports in unpopulated areas.
 - Definite need for on board weather retrieval systems displayed on MFDs.
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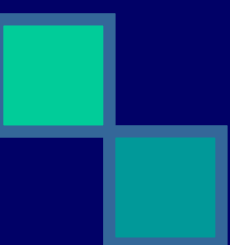



Limitations on Weather Reporting

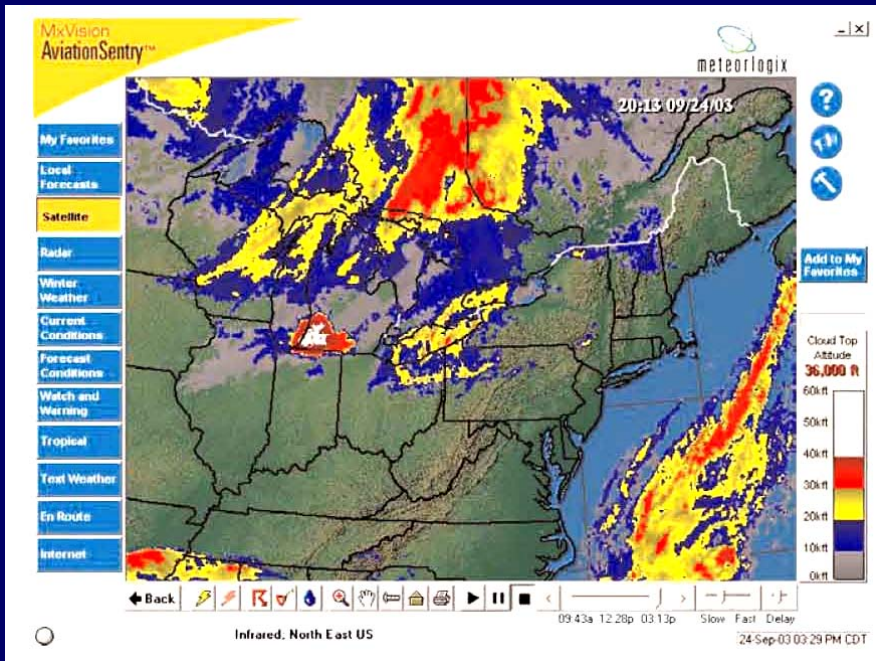
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- METAR: When available, only covers the area within 5 miles of the reporting station.
 - TAF: When available, only covers the reporting station/airport within 5 miles.
 - AWOS/ASOS: Not readily available at a significant number of airports. Only available at hospital helipads if deemed necessary by the owner of the heliport.
 - *Aside from personal observations, what other weather reporting is generally available???*
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Area Forecast

- FA: Is reported for very large areas (hundreds of square miles).
 - The air medical helicopter pilot must rely on this the majority of the time due to the distance and availability limitations of METAR/TAF.
 - Although pilots are well trained, when operating in VFR cross country conditions, in most cases, he or she must “take their best guess.”
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Typical RADAR Products Available Commercially-*Ground Based...* *We Can't Take 'Em With Us*



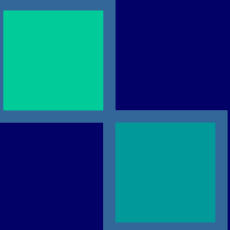

Multi-Function Displays

- Download data is currently commercially available.
- Do possibilities exist to integrate into the FAA, NWS, & NOAA basic weather products?
- RADAR is already available on the Aviation Digital Data Service online.



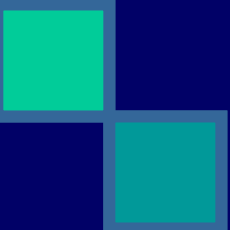



Regulatory Enhancements- NTSB Recommendations

- Require all EMS operators to comply with Part 135 OPSSPECS on all flights.
 - Require EMS operators to develop flight-risk evaluation programs.
 - Require formalized dispatch and flight following procedures to include up-to-date weather information and assistance in risk assessment decisions.
 - Require TAWS and to provide adequate training to flight crews.
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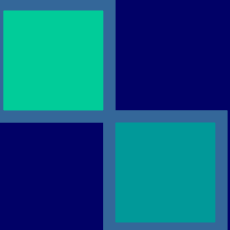


Continuous Evaluation

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- Management needs to be involved at every level to promote open communication and insure they understand the needs of the team in the operational environment.
 - Every opportunity to enhance the organization through the use of technology, information, and resources should not be overlooked. Being pro-active will, in time, effect positive changes.
 - The FAA oversight needs to continue, with continuing positive focus on implementation of current and future air medical guidance and regulation.
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Conclusion

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- We must address and integrate the “Human Factors” issue in weather and other operational decision making.
 - Regardless of the aircraft equipment or currently available weather products, the information must be delivered to the pilot in such a format that the cognitive function can apply the information available and take an appropriate course of action.
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