CHAPTER 14 RISK MANAGEMENT

14.1 INTRODUCTION

EMS is a unique industry. Often, the poor conditions that contributed to an accident are the same conditions the EMS crew will face when responding. The following is a guideline for managing the risks encountered during daily operations. If we can't manage the risk, we can't afford the risk!

14.2 RISK ASSESSMENT DEFINED

Risk assessment is nothing more than the process of evaluating all the individual risks associated with a task and then determining if the cumulative risk is worth the potential gain. Your risk analysis will give you several options:

A. You can perform the task as proposed;

B. You can modify the task to make it less risky (substitute a more likely time of day, better weather scenario or different crew);

C. You can wait for a better night, or cancel!

14.3 RISK MANAGEMENT OUTLINE

A. Identify the Hazard: The hazards are the potential sources of danger – unfamiliar terrain, unknown landing zone, fatigue, changing weather conditions, crew endurance, limited planning time, crew inexperience, intense darkness and poor communications!

B. Assess the Hazards: Each hazard is analyzed to determine both the likelihood of its causing a problem and the severity of the consequences should such a problem occur. The result of the analysis should provide a description of the impact of the combined hazards. The end product is a statement that quantifies the risk associated with the operation: extremely high, high, medium or low.

1 *Extremely High Risk:* Loss of ability to accomplish the task.
2 *High Risk:* Significantly degrades capabilities in terms of required standards.
3 *Medium Risk:* Degrades capabilities in terms of task requirements .
4 *Low Risk:* Little or no impact on accomplishment.

C. Make a risk decision: Weigh the risk against the benefits. All risk decisions should be made on the relevant aviation and operational factors. Patient condition should never be a factor in the go-no-go decision.

D. Implement controls: Controls function to reduce or eliminate hazards. Simple controls can come in the form of a short safety briefing or guidance on procedures.

E. Supervise: Supervision goes beyond ensuring that people do what is expected of them. It includes following up during and after activities to see if all went according to plan and to bring up areas that are sounding alarms in your brain. This also helps to anticipate and prepare for unforeseen issues. Lessons learned can be used when planning the next mission.

14.4 RISK IDENTIFICATION

There are numerous ways to identify risks:

1 Review of AIDMORs, accompanied with data analysis and trend information. Over time one may draw conclusions that problems exist and once identified, risk mitigation procedures can be instituted.

2 By conducting inspections or surveys. Someone physically examines or participates in an operation and notes the hazards involved; or, deliberately and systematically surveys, or inspects each operational entity and location.

3 Through the experience of others, we may learn about the risks involved in a given situation. Lessons learned are a valuable asset in the risk management business. Pilots, mechanics, and other employees will be required to share lessons learned as requested by the Corporate Safety Manager for the benefit of all employees.

4 A Route Cause Analysis is conducted when risk/hazard trends are identified. Recommendations are reviewed and become part of formal Safety Change process.

14.5 RESOLUTION OF THE RISK

A. It doesn't matter how the risk is discovered or identified as long as it is brought to the attention of management. The question is "what is going to be done about it?" You should never assume that all risks deserve equal consideration. There are always inherent risks in doing business, especially in aviation. Some are very serious, some are only, remotely hazardous. One needs some method of sorting these out and giving each risk the amount of attention it deserves.

B. The problem of resolving risk is in conflict with most standard tests of time, cost and feasibility. There is not enough money to fix everything that's considered a risk. There are a few solutions and the impractical solution is as bad as none at all.

C. Each risk generates two decisions:

1 Is it worth correcting? (a safety management decision).

2 Considering time, cost and feasibility, what is the best way to do it? (a general management decision).

14.6 RISK ASSESSMENT MATRIX

A. Once the risk has been identified, you need to determine the seriousness of the risk. The risk assessment matrix is one way to do so.

B. Basically, the matrix forces a subjective decision on the probability of a particular risk resulting in an accident and the severity of that accident if it should occur. Use of the matrix produces a number. This automatically prioritizes the risk and provides an arbitrary numerical order in which to work on several risks. The prioritized risk should be addressed in the order of greatest threat. Once the higher level threats are managed a re-evalution of the remaining risk should be made.

C. You may assume that any risk with a score of one, two or three is serious and deserves early or immediate correction. Any hazard scoring four, five or six is less serious or even insignificant. It can wait to be corrected, or it may not be worth correcting at all. Risks scoring four, five or six are either unlikely to occur or likely to produce negligible damage if they do occur. This matrix allows you to put time and emphasis where it is needed and avoid wasting it on insignificant problems. For example, rotor wash is an assumed risk every time a helicopter flies. How do we correct rotor wash? The only way to eliminate rotor wash is to not fly. This is not a feasible solution. Therefore, we manage the risk the best we can by use of high recons, looking for debris that may cause damage, limit landings near populated areas and structures that may be damaged, etc. See Risk Assessment Matrix at the end of this chapter.

14.7 ACTIONS REQUIRED TO RESOLVE THE RISK

A. Actions are listed in priority order beginning with the engineering action. Engineering action implies some physical change to a situation such as modification of the aircraft, or the removal of an obstruction. This is always the first choice of actions as it is the primary one that physically eliminates the risk.

B. It is not always possible to take the engineering action, or sometimes it is possible to take it, but not immediately. This forces one to consider the next general method of controlling risks – the procedural action. This action does not eliminate the risk, but it does control it to the point of reducing the risk. This might be an action, which would limit operation of the aircraft or placing a guard around the danger point of the equipment or limiting access to the equipment to only those trained to operate it. Since the risk exists, there is no assurance that this action will guarantee that accidents will never occur.

C. The final choice, and the least effective of the methods, is to issue a warning. In this case, nothing is done to eliminate or reduce the hazard, but merely makes people aware of its existence or trains them to accept it. Obviously, this is very ineffective, since we can never guarantee that warnings of the existence of the hazard will be received, or followed, without failure. The tendency in safety is to take action in exactly the reverse order, i.e., the personnel warning action first. Sometimes this is necessary because the engineering action cannot be taken immediately, or because it was never considered.

14.8 RISK MANAGEMENT DECISION/ACTION TREE

At the conclusion of this section is another method for deciding on the degree of risk involved and the actions to be taken. Rather than using the numerical index of risk as suggested in the Risk Assessment Matrix a risk management decision/action logic tree yields a subjective assessment of the level of risk and then asks if that level of risk is acceptable. If it is acceptable, then the operation may continue with no additional action needed on the part of the Manager. If the level of risk is not acceptable, then it must be either eliminated or reduced. The elimination choices are shown at the bottom left of the tree while the reduction choices are shown at the bottom right. These choices are analogous to the hierarchy of actions suggested in the previously mentioned Risk Assessment Matrix. If the level of risk is not acceptable and it can neither be eliminated nor reduced, then the operation should be canceled.

Risk Assessment Code Matrix

		LIKELIHOOD			
SEVERITY		Likely to Occur NOW! A	Probably will occur B	May Occur C	Unlikely to occur D
Catastrophic! Death, or critical equipment loss	I	1	2	3	4
Critical! Severe Injury, or rmajor damage.	II	1	2	3	4
Marginal. Minor injury, or minor damage.	III	3	3	4	5
Negligible. No effect on personnel. Insignific ant damage.	IV	5	5	6	6

Hierarchy of Actions

Engineering Actions First Choice! Corrects the problem. Eliminates the hazard.

Procedural Actions Less Effective. Guard the point of hazard. Restrict or limit operation of the equipment. Adjust operational procedures. Personnel Actions Least effective. Post warnings. Brief all personnel.

RISK ASSESSMENT PROGRAM

To assist in reducing incidents and accidents, Air Methods has developed and implemented an operational risk assessment program to assist pilots in identifying, assessing, and managing risks and then ensure that they are mitigated, deferred, or accepted.

Description:

The risk assessment matrices (reference page B-34), **must be utilized for each flight assignment** (each mission). **The results of the pilot's risk assessment shall be recorded on the Daily Flight Log (DFL)** in the "remarks" section with the notation "A", "B", "C", or "D" as appropriate.

Risk areas (AIRCRAFT, ENVIRONMENT, and FATIGUE) are listed on the left of the matrix. Use the lowest row applicable. For example, the pilot has an aircraft issue and a fatigue issue; the pilot would then utilize the FATIGUE row. If the pilot has an aircraft and an environment issue, the pilot would then utilize the ENVIRONMENT row.

These matrices are **not** intended to make the decision for the pilot and do not list every possible risk factor that may be encountered for a particular flight assignment, but are to be used as **a tool to assist** the pilot in identifying, assessing, and managing risks. The pilot must then decide to accept or decline the flight assignment.

These matrices must be made available to each pilot and the pilot must utilize them before making a decision to accept or decline a flight assignment. The pilot will advise the communications center of their risk assessment value by phone, in person, or by radio prior to liftoff or as soon as possible after liftoff.

RISK ASSESSMENT MATRIX: **DAY OPERATIONS**

APPLY OPERATIONAL FACTORS	APPLICABLE WEATHER FOR FLIGHT WEATHER: Well above minimums and stable.	CEILING: Within 200 ft of minimums.	VISIBILITY: Within 1 mile of minimums.	CEILING & VISIBILITY: Within 1 mile and 200 ft of minimums.
DAY: • NORMAL OPS	GREEN (A)	BLUE (B)	BLUE (B)	YELLOW (C)
AIRCRAFT: • PERFORMANCE NEAR MAX • BACK-UP AIRCRAFT • MEL ITEMS	BLUE (B)	BLUE (B)	YELLOW (C)	ORANGE (D)
ENVIRONMENT: • EXTREME HEAT OR COLD • HIGH WINDS • STORMS IN AREA • MOUNTAINOUS TERRAIN • UNFAMILIAR LZ/AIRSPACE • TEMPORARY BASE	BLUE (B)	BLUE (B)	YELLOW (C)	ORANGE (D)
FATIGUE: • LATE IN SHIFT • CONSECUTIVE SHIFTS	BLUE (B)	BLUE (B)	YELLOW (C)	ORANGE (D)

RISK ASSESSMENT VALUE

COLOR	IDENT	DEFINITION
	A	NORMAL OPERATIONS
	B	CAUTION
	C	EXTREME CAUTION
	D	CRITICAL DECISION TO BE MADE

RISK ASSESSMENT MATRIX: **NIGHT OPERATIONS**

APPLY OPERATIONAL FACTORS	APPLICABLE WEATHER FOR FLIGHT WEATHER: Well above minimums and stable.	CEILING: Within 200 ft of minimums.	VISIBILITY: Within 1 mile of minimums.	CEILING & VISIBILITY: Within 1 mile and 200 ft of minimums.
NIGHT: • NORMAL OPS	GREEN (A)	BLUE (B)	YELLOW (C)	ORANGE (D)
AIRCRAFT: • PERFORMANCE NEAR MAX • BACK-UP AIRCRAFT • MEL ITEMS	BLUE (B)	BLUE (B)	YELLOW (C)	ORANGE (D)
ENVIRONMENT: • EXTREME HEAT OR COLD • HIGH WINDS • STORMS IN AREA • MOUNTAINOUS TERRAIN • UNFAMILIAR LZ/AIRSPACE • TEMPORARY BASE	BLUE (B)	BLUE (B)	YELLOW (C)	ORANGE (D)
FATIGUE: • LATE IN SHIFT • CONSECUTIVE SHIFTS	BLUE (B)	YELLOW (C)	YELLOW (C)	ORANGE (D)

RISK ASSESSMENT VALUE

COLOR	IDENT	DEFINITION
	A	NORMAL OPERATIONS
	B	CAUTION
	C	EXTREME CAUTION
	D	CRITICAL DECISION TO BE MADE

NOTE: The pilot must also consider their (and the medical personnel/crewmembers) experience level with system enhancements (i.e. night vision goggles, autopilot, etc) when performing their risk assessment.

Air Methods Corp operates an Enhanced Operational Control Center that uses custom, specialized software developed specifically to assist the company in identifying hazards and risks to aircraft and crew. Portions of the Air Methods Corp General Operations Manual as it applies to the Operational Control Center are included.

GENERAL

The Operational Control Center (OCC) is committed to safe, professional air medical transport. Our initiatives and programs are dedicated to enhance safety by monitoring significant safety of flight issues relating to hazards, weather conditions and airspace restrictions. The goal is to protect assets and increase safety by supporting pilots and Communication Center's therefore increasing the awareness of possible adverse weather or other in-flight hazards. In addition, the Operational Control Center serves as a 24/7 staffed element for Flight-monitoring and assistance as well as a coordination center for Air Methods during normal, night, and holiday hours.

PURPOSE

The Operational Control Center is an Agent for Air Methods Corporation assisting with Operational Supervision and Control. The OCC is primarily responsible for flight surveillance while providing Advisory/Alert information affecting Air Methods aircraft. Advisories/Alerts may include, but are not limited to, flying in the vicinity of marginal or deteriorating weather conditions, temporary flight restrictions (TFR), ground proximity or any other significant possibility that could become a hazard to flight. All alerts will be communicated to the pilot or the appropriate Communication Center responsible for Flight Following.

OPERATIONAL CONTROL SPECIALIST DUTIES AND RESPONSIBILITIES

- Reports to the Aviation Compliance Manager.
- Interfaces with the Director of Operations and the Chief Pilot.
- Answers all incoming requests for service in a professional and courteous manner.
- Initiates Post Accident Incident Plan (PAIP) when necessary.
- Notifies Certificate Management of accidents, incidents, or other significant events.
- Responsible for a thorough knowledge of flight tracking programs.
- Responsible for monitoring all flight conditions that may affect Air Methods aircraft from take off to landing IAW FARs and the Air Methods Corporation Operations Manual.
- Assists Communication Centers with Options for Enroute Adverse Weather Condition Options.
- Assumes flight following responsibilities for aircraft when a Communication Center is out of service.
- Ensures a thorough knowledge of Section I of the Air Methods Corporation Operations Manual, Communications Specialist Guidance.
- Completes the initial and recurrent Communications Specialist Training and Examination IAW page I-2 of the Air Methods Corporation Operations Manual.
- Will complete the Operational Control Specialist training program. Elements of the training may be completed by attending the Pilot's Basic Indoctrination training course.
- Monitors Flight Log for compliance.
- Ensures a thorough knowledge of FAR Part 91 and 135 regulations.
- Ensures a thorough knowledge of the Air Methods Corporation Operations Manual.
- Responsible for meeting operational goals, initiatives, and objectives.
- Analyzes aviation weather to determine marginal and hazardous conditions for flight.
- Understands and applies the Air Methods Risk Assessment Program and how Risk Assessment Values are determined.
- Organizes all Sources of Flight Information to Determine and Develop an Operational Control Center Flight Advisory/Alert.

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- Rapidly disseminates Advisories/Alerts to the appropriate Pilot's or Communication Centers of known or forecasted severe weather conditions, TFRs, or any concerns pertaining to safety of flight.
- Assists Communication Centers with options for aircraft with enroute Deteriorating Weather Conditions.
- Receives and records all information transmitted to the Operational Control Center.
- Ensures dissemination of transmitted information to responsible areas.
- Maintains 24/7 staffing of the Operational Control Center.
- Performs other duties as assigned.

FLIGHT SURVEILLANCE

The Operational Control Specialist (OCS) shall track the status of all in-flight aircraft operated by the Air Methods Corporation and monitor the Alert System for hazards.

FLIGHT FOLLOWING

The OCS shall follow the procedures outlined in Section I and on page B-14 of the Air Methods Corporation Operations Manual when flight following for a communication center that is out of service. The Operational Control Center may provide flight following for pilots who are ferrying aircraft and have two-way communication with the Operational Control Center.

HAZARD TO FLIGHT ALERT

All Operational Control Center Alerts will be transmitted as rapidly as possible to the appropriate pilot or Communication Center. The Communication Center responsible for the enroute aircraft within the advisory area will be contacted with all pertinent information including, but not limited to:

- Source of Information (Adverse/Deteriorating Weather, Forecasted Adverse Weather, TFR, SIGMET, National Weather Service Warning, etc.)
- Type of Hazard (IFR Conditions, TS, GR, FU, TFR, etc.)
- Location and Limits of Affected Area.
- Effective Time and Duration of Hazard.
- Bearing, Distance, Location, Movement, Speed, etc. of Hazard in Relation to the Affected Aircraft.
- Remarks (Any Pertinent Information).

POST ACCIDENT/INCIDENT PLAN

The Operational Control Specialist will notify Certificate Management of a PAIP without delay. The OCS will have a thorough knowledge of section B-31 of the Air Methods Corporation Operations Manual. The OCS is not the primary contact point for a PAIP. Programs must use the PAIP that was developed for their specific program. When requested, the OCC will provide assistance to any communications center dealing with an incident or emergency.

NON FLYING ALERTS

As time permits the Operational Control Center will provide hazardous weather advisories to bases or areas of operation. The purpose is to provide advanced notice so that bases can activate their hazardous weather plans to protect their assets.

APPLICABILITY

All operations conducted by Air Methods shall be considered "for hire" under FAR Part 135 except:

- Training flights.
- Maintenance flights.
- Ferry flights conducted for Air Methods' purposes.
- Repositioning flights with Air Methods' employees on board.

All helicopter VFR operations (including those listed above conducted under FAR part 91 in VFR conditions) shall adhere to the weather minimums listed on page BA-10 of the Air Methods' Operations Manual.

All fixed wing VFR operations shall adhere to applicable regulatory requirements.

EMERGENCY DEVIATION

When emergency conditions do not allow the company to effect a timely amendment of the Operations Manual or Operations Specifications, the Director of Operations, Chief Pilot, or Director of Maintenance will seek and receive a verbal authorization from the Certificate Holding District Office (CHDO). The Director of Operations, Chief Pilot, or Director of Maintenance in turn will provide documentation describing the nature of the emergency within 24 hours of the verbal authorization.

SECTION B – FLIGHT OPERATIONS

FLIGHT OPERATIONS – GENERAL

OPERATIONAL CONTROL

[119.9, 119.43]

Air Methods utilizes a two-tier system of operational control. The first tier consists of the managers and directors listed in Operations Specifications Paragraph A006 and the Air Methods 411 system. The 411 system verifies that a pilot is trained, qualified, and meets the duty rest requirements. Once the 411 system has validated that the requirements are met the pilot will be issued an electronic flight release for the duration of their shift.

The second tier consists of the operational control a Pilot in Command (PIC) exercises as the final authority to the operation of the aircraft. This includes the determination of whether a flight can be accepted, initiated, conducted, or terminated and the tactical and dynamic decisions made by the PIC during the flight in accordance with the guidance provided in the Regulations, General Operations Manual, and Operations Specifications. Only a PIC who is a direct employee of the company may exercise Second-Tier Operational Control, over any Air Methods flight. In the event the PIC is unsure that a flight assignment can be conducted in accordance with Regulations, General Operations Manual, and Operations Specifications the PIC will contact a manager listed in paragraph A006 of the Operations Specifications or the Operational Control Center for additional guidance and input.

Federal Aviation Regulations require that Air Methods be properly named and identified as the company providing the air transportation, and as such, must be included in all printed or advertising matter offered to the public. The intent of this regulation is to inform the public of the identification of the Federal Aviation Administration (FAA) certified and authorized operator of the aircraft. Aircraft operated on the Air Methods Air Carrier Certificate shall have displayed on the aircraft **"Operated By Air Methods"** so that it is legible and clearly visible and readable from the outside of the aircraft to a person standing on the ground at any time except during flight. At no time shall any non-certificated entity attempt to exercise Operational Control, nor hinder in any way, Air Methods' oversight and/or exercising of Operational Control of any and all operations carried out under Air Methods' Certified Air Carrier Certificate. (QMLA253U).

All employees, methods, equipment, and facilities used or employed by Air Methods will at all times be under Air Methods' operational supervision and control. Air Methods' personnel may be requested to, but shall not be required to assist in any patient care or patient handling except to the extent of providing patient transportation.

Pilots, mechanics, and other Air Methods' personnel will abide by all Air Methods' personnel policies as well as hospital or program rules and policies provided in written form to, and approved by Air Methods, concerning, conduct, and appearance. Air Methods shall retain full authority and rights to unilaterally exercise its right to hire, discipline, or remove its personnel from assignment. Compliance with Air Methods Operations Specifications and Operations Manual is mandatory. Failure to adhere to the certificate holder's directions and instructions may be subject to legal enforcement action by the FAA.

Hospitals or other agencies have the right to request flight operations of Air Methods' aircraft and may request that Air Methods respond for any mission. A request from a hospital transport call center is an authorization for Air Methods to proceed with evaluating, in accordance with established and authorized procedures specific to Air Methods' Air Carrier Certificate, whether a flight can be completed. The hospital transport call center has no authority to override the authority of Air Methods, or the pilot's authority to refuse any mission request due to weather, maintenance, regulatory limitations, or other flight safety issues. At no time during a response to a medical flight will speed into action criteria be allowed to compromise safety.

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OPERATIONAL CONTROL (Continued)

All communications center personnel that intake flight request and/or flight follow with an Air Methods' aircraft must be trained according to the Air Methods FAA accepted Communications Specialist Training Program. The training program will be administered by the Program Aviation Manager or Aviation Services Manager that has responsibility for the communications center. The course completion documentation will be retained at the local program level. Additionally, the Program Aviation Manager or Aviation Services Manager shall keep an updated list of the names of all currently trained and utilized Communications Specialists in the "Comm. Spec. List" on the "135 Aviation Ops-Air Methods" page of the Air Methods Internet Based Portal.

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SECTION I – COMMUNICATIONS SPECIALIST GUIDANCE

Air Methods Pilot Hiring Guidelines (HBS & CBS Operations)

General requirements (all pilots):

- Commercial/Instrument license required. ATP rating in category meets this requirement.
- Second Class Medical certificate required; First Class if operational or contract required.
- Recency of experience: If a pilot has not flown within the previous 24 months, it is required that the individual obtain a biennial flight review before being given consideration or accomplish an evaluation ride with a company Check Airman. The method of compliance will be determined by certificate management.

Flight Hours (Flight time must be verified through reliable documentation)

Pilot in Command:

Visual Flight Rules (VFR) Program:

- 2000 total flight hours with minimum of 1500 flight hours in category.
- 1000 hours PIC in category.
- 500 turbine. (If less, experience review will be made by certificate management).
- 100 hours unaided night as PIC (50 hours of unaided can be substituted for by 100 hours of NVG time, but cannot be reduced below 50 hours of unaided time).
- 50 hours total actual or hood instrument time in category (for a RW candidate who is FW rated, 100 hours or greater of FW actual or hood Instrument time can reduce the required instrument time to 25 hours).

Instrument Flight Rules (IFR) Program:

- 2500 total flight hours with minimum of 2000 flight hours in category.
- Same as VFR minimums with the exception of the following:
    - 100 hours total actual instrument time. (For a RW candidate who is FW rated, 100 hours or greater of FW Instrument time can reduce the required instrument time to 50 hours).

Second-In Command:

- 500 hours in category preferred.

All Fixed Wing programs are based on IFR hiring guidelines and require 300 hours of turbo prop experience for PIC positions. For fixed wing PIC and SIC positions a fixed wing multi-engine rating is required for bases operating twin engine aircraft.

Any simulator time utilized to meet a minimum will be evaluated by certificate management. Any fixed wing hours utilized to offset instrument experience must be accomplished by a fixed wing rated pilot.

Candidates lacking some of these minimum qualifications may still be considered based on a review of the resume by the Chief Pilot, Aviation Training Managers, or Director of Operations. In no case should the recommended experience levels be reduced by more than 10 percent. The Director of Operations will have final veto authority over these situations. ***At no time will the hiring requirements be less than those set forth in FAR 135.243.***