

Approved July 10, 2010 – all changes and additions compared to the 7th Edition in Red BOLD

(There is a completely new format with Examples of Evidence to Meet or Exceed Standards)

8th EDITION ACCREDITATION STANDARDS
of the Commission on Accreditation of Medical Transport System

Although the FAA and other U.S. authorities are referenced in the standards, equivalent regulations outside of the U.S. are referenced when reviewing international medical transport services.

Standards apply to each transport mode unless specifically designated as Rotorwing (RW), Fixed Wing (FW), or Ground (G)

Section 1 – Management & Quality

01.01.00 MISSION STATEMENT AND SCOPE OF CARE

01.01.01 There is a Mission Statement **written in the present tense that describes the purpose of the service, mode(s) of transport provided and its constituents. The Mission Statement directs employees toward the Values the service was founded upon.**

01.01.02 There is a **written** scope of care that describes the types of patients accepted. **The scope of care is commensurate with the qualifications and level of initial and ongoing education required for medical personnel.**

Examples of Evidence to Meet Compliance:

The Mission Statement describes what you do. The scope of care describes what type of service you perform, what patients you transport and what type of medical teams you provide, etc. Both are clear and concise and understood by all. The vision and mission are strategic statements developed by and unique to each organization. Values statements are separate but key underpinnings of these statements. The models of transport and constituents are not, and should not be part of these statements but, rather, should be included under a “scope of service and care” statement.

01.02.00 FINANCIAL COMMITMENT

01.02.01 There must be evidence of financial commitment to the program by the administrative structure and through financial resources that provide excellence in patient care and safety of the transport environment.

Examples of Evidence to Meet Compliance:

Transport vehicle is well kept – equipment and supplies are well maintained, accessible and adequate for patient population(s)/volume. Physical surroundings are well maintained. There are adequate management and staff personnel for transport volume. Education appropriate to the scope of care and to all aspects of the organization (Communications, Flight Crew, Medical Crew, etc.) is provided.

01.02.02 Insurance - The transport service must have and maintain insurance against loss or damage of the kinds customarily insured against and in such types and amounts as are customarily carried under similar circumstances by similar businesses. The insurers must be financially sound and reputable, and they must be qualified to do business in the state(s) **or country** in which the transport service is located.

The types of insurance should include but are not limited to the following:

1. Hull insurance for each aircraft operating in the EMS environment. Aircraft liability provides coverage with a single limit **that must** comply with the following minimums: (RW/FW)

a. Fixed Wing (U.S. dollars)

\$5 million for twin engine aircraft

~~\$10~~ **25** million for turbo props and light jets*

~~\$20~~ **30** million for heavy jets*

**(See Glossary in Appendix for definitions of light jets and heavy jets)*

b. Rotorwing – ~~\$40~~ **30** million (U.S. dollars)

2. Auto insurance (for ground vehicles and ambulances owned by the service) - **\$1 million (U.S. dollars)**

3. Medical malpractice - **\$1 million (U.S. dollars)**

4. Worker's compensation – **follow State or equivalent govt. guidelines**

5. Group life insurance or accidental death and disability at 3 times the crew member's annual salary.

01.03.00 MARKETING AND EDUCATION FOR THE PUBLIC

01.03.01 There is a professional and community education program and/or printed information with the target audience to be defined by the medical transport service.

1. Clear identification of the FAA Part 135 Certificate Holder (**or pertinent national aviation authority**) as the entity that is operating the aircraft on the program's website, in marketing materials and on the aircraft. (RW/FW)

2. Must provide evidence of State licensure for each transport vehicle as appropriate to State or local guidelines.

3. State or local license for each transport vehicle is accessible to the public.

3. Hours of operation, phone number, and access procedure.

4. Capabilities of medical transport personnel.

5. Type of aircraft/ground interfacility ambulance(s) used and operational protocols specific to type.

6. Coverage area for the transport service.

7. Preparation and stabilization of the patient.

8. Patients considered appropriate for transport by the medical transport service. Generally, an appropriate transport is one that enhances patient outcome, safety and cost effectiveness over other modes of transport.

Examples of Evidence to Meet Compliance:

Marketing materials are up to date, consistent with mission and scope, depict actual types of aircraft/ambulances etc. and do not exaggerate the scope of care or aircraft/ambulance capabilities.

01.04.00 ETHICAL BUSINESS PRACTICES

01.04.01 The transport service develops and demonstrates use of a written code of ethical conduct in all areas of business that demonstrate ethical practices in business, marketing and professional conduct.

1. The code of conduct guides the service when confronted with potential compliance or ethical issues.
2. The code of conduct outlines the service's standards for ethical behavior as well as contact information and reporting protocols if a standard has been violated.
3. The code of conduct outlines ethical billing practices.

Examples of Evidence to Meet Compliance:

Policies may address such issues as proper/improper behavior toward other programs' marketing materials, honesty in reporting data, personal cell phone use, use of social networking sites, how ethical issues are addressed, conflicts of interest, phone etiquette, acceptable and unacceptable behaviors on the worksite/on transport, acceptance of gifts from patients/vendors, etc.

01.04.02 Ethical business practices must include specific guidelines for transport requests that are not performed directly by the CAMTS accredited service/service seeking accreditation as follows: (RW/FW)

1. Referring flights - If an accredited program refers a flight to another service, the accredited service/service seeking accreditation will attempt to refer a transport to another CAMTS accredited service whenever possible if unable to perform the transport.
2. Brokering flights - Brokering is defined as arranging for transport and collecting a fee but not actually performing the transport. This is not an acceptable practice of an accredited service because there is no opportunity to review patient care and safety. If the accredited service/service seeking accreditation cannot fulfill a request for transport, the service may elect to subcontract.
3. Subcontracted flights – This applies to the occasion when another service is used to supply a portion of the transport, such as the aircraft or the medical team if the service's aircraft is not available or is not appropriate, or the medical team is not available nor appropriate. The subcontracting service will bill the patient or payor for the transport.
4. Outsourcing flights– This is defined as transferring a request to another service but retaining control of the coordination throughout the transport. The service may add a fee for coordinating the flight, but full disclosure (to the patient and his/her advocate and the payor source) about the aircraft and medical crew is required. Less than 5% of the domestic requests (transports within the North American continent) may be outsourced.

01.04.03 If an accredited service subcontracts or outsources a request for transport, the following conditions are maintained in practice and policy: (RW/FW)

1. The other service will be CAMTS accredited whenever possible unless there is not one in the service range, or the CAMTS accredited service is not available within an appropriate response time based on patient condition and needs.
2. If unable to subcontract or outsource to a CAMTS accredited service, the service should have written contracts with aviation services and other medical programs that are outsourced to or subcontracted. The contract should state that the service subcontracted or outsourced to is not CAMTS accredited.
 - a. Attempts to contact a CAMTS accredited service will be documented (which service and date and time of contact) along with reasons for not contracting with a CAMTS accredited service.
 - b. Transport requests that are outsourced to or subcontracted will be tracked and trended as part of the Utilization Review process.

3. If an unfamiliar aircraft is used (either by the originating team or the other team), a medical team member familiar with the operation of medical systems, communications and emergency procedures must accompany the transport team.

4. The accredited program will disclose through a signed agreement (that may be signed on site, faxed or electronically transmitted) with the requesting agent, patient and payor source whenever the transport is not performed by their program, medical teams and/or aircraft. (This does not apply to specialty teams that are listed as part of an accredited service.)

(See Glossary in Appendix for definitions of referred, broker, outsource and subcontract.)

Examples of Evidence to Meet Compliance:

Signed agreements reflect when part of the service is not provided by a CAMTS accredited entity such as a subcontracted aircraft or medical team. All referred, subcontracted and/or outsourced requests are tracked and trended in the QM review process.

01.04.04 The transport service will know the capabilities and resources of receiving facilities and will transport patients to appropriate facilities within the service region based on direct referral, approved EMS plan, or services available when no direction is provided.

1. Whenever possible, services that respond directly to the scene will transport patients to the nearest appropriate hospital (i.e. major trauma to the nearest Level I or II Trauma Center, stroke patients to a hospital with specialized stroke care, acute myocardial infarction patients to a hospital with a staffed cardiac catheterization lab, major burns to a Level I or II burn center, high-risk OB patients to a hospital with OB services and a Level II or III NICU, etc.). *See References for Centers for Disease Control trauma triage guidelines.*

2. Management ensures, through policy, that all transfers of patient care occur from a lower level of care to an equal or higher level of care except for elective transfers for patient convenience or returning a patient to a referring facility/residence.

3. Accurate estimated time of arrivals (ETAs) are always provided regarding arrival of the service to the patient for emergency requests.

4. Contractual relationships with public services or health care agencies do not reflect implied referrals.

5. Subscription services do not reflect implied referrals that could negatively impact expeditious transport of patients to the most appropriate facility.

Examples of Evidence to Meet Compliance:

Contracts do not exceed current market value for goods and/or services with the intent to influence requests or referral patterns.

01.04.05 All patient care resources, including personnel and equipment, necessary to the program's mission must be readily available in the aircraft/ground transport ambulance or available to place in the aircraft/ground transport ambulance, and they must be operational prior to initiating the mission. This includes resources, personnel, and equipment provided by Specialty Care Providers.

01.05.00 COMPLIANCE

There is a corporate compliance officer or designated person responsible for ensuring that the service is in compliance with external laws and regulations, payer requirements and internal policies and procedures.

01.05.01 Compliance issues may include but are not limited to:

1. Health Insurance Portability and Accountability Act (HIPAA)*
2. Federal Civil Statutes (False Claim Act)*
3. Balanced Budget Act of 1997*
4. Office of Inspector General (OIG) Compliance Program Guidance*
5. OIG annual work plans (hospital affiliated)*
6. Anti-kickback and Stark Laws*
7. Emergency Medical Treatment and Active Labor Act (EMTALA)*
- 8. Red Flag Rules (Identity Theft Prevention Program) ***
- 9. Federal Sentencing Guidelines**

* (See References in Appendix)

01.05.02 The compliance program includes:

1. Written policies and procedures.
2. Designation of a compliance officer or assignment of responsibility to a specific individual or individuals.
3. Conducting effective training and education for staff with documented initial and ongoing competency.
4. Developing effective lines of communication.
5. Enforcing standards through well-published disciplinary guidelines.
6. Auditing and monitoring.
7. Responding to detected offenses and developing corrective action.

Examples of Evidence to Meet Compliance: *Staff is knowledgeable about current compliance issues.*

01.06.00 MANAGEMENT/POLICIES

01.06.01 There is a well-defined line of authority.

1. There is a clear reporting mechanism to upper level management. An organizational chart defines how the medical transport service fits into the governing/sponsoring institution, agency or corporation.
2. For public or private institutions and agencies that contract with an aviation **or ambulance** company for transport, there should be a policy that specifies the lines of authority between the medical management team and the aviation/ambulance management team
3. All personnel understand the chain of command. Medical personnel understand that the pilot in command has ultimate authority for the aircraft and safe operations. (RW/FW)
4. Managers are oriented to **national aviation regulations** (FARs in the U.S.) that are pertinent to the medical service - including the names and titles of each person authorized by the **aviation regulator** to exercise operational control. (RW/FW)
- 5. Managers are trained to recognize real and perceived pressures that may influence unsafe acts by staff.**
6. The program adheres to **State/Provincial, National and/or Local** ambulance (air and ground) rules and regulations including licensure requirements.

7. Management demonstrates strategic planning that aligns with the mission and vision and values of the service.

8. Management sets written guidelines for press-related issues and marketing activities.
9. A policy should be in place that documents the employer's disciplinary process and protects employees from capricious actions.

Examples of Evidence to Meet Compliance:

Business plans demonstrate a needs and risk assessment when expanding the service or adding bases that includes staffing, training and management restructuring for added responsibilities.

Examples of Evidence to Exceed Compliance:

Management is educated to Just Culture and applies Just Culture principles throughout the organization.

01.07.00 – MISSION TYPES AND PROFESSIONAL LICENSURE

Mission Types – Staffing should be commensurate with the mission statement and scope of care of the medical transport service. The aircraft or ambulance, by virtue of medical staffing and retrofitting of medical equipment becomes a patient care unit specific to the needs of the patient. **A well-developed position description for each discipline is written.**

01.07.01 CRITICAL CARE - A critical care mission is defined as the transport of a patient, from a scene or a clinical setting, whose condition warrants care commensurate with the scope of practice of **critical care transport professionals. (i.e.: physician or registered nurse)**

1. The medical team must, at a minimum, consist of a specially trained physician, registered nurse as the primary care provider.
2. A physician or registered nurse may be designated as the primary care provider if he/she meets the following criteria:
 - a. There are adequate personnel to provide full coverage with physicians or RNs who are primarily assigned to the medical transport service and are readily available within the response time determined by the service.
 - b. The physician or RN must have appropriate state licensure.
 - c. Pre-hire qualifications require a minimum of three years critical care experience for RNs. and a plan to assess and document the competency and proficiency of the provider to perform in the critical care medical transport environment.**
 - d. Pre hire background checks include criminal background, license verification, and previous employer at a minimum are outlined in a policy.**

Examples of Evidence to Exceed Compliance:

Three to five years critical care experience is required pre-hire. Nursing certification such as CEN, CFRN, CPEN, or CCRN are required pre-hire.

3. Critical care missions require an additional team member, for a minimum of 2 medical attendants (for example, but not limited to, RN/RN, RN/**RT**, RN/MD, RN/Paramedic or alternative team composition), while a patient(s) is on board. Personnel should be available for each transport within a response time determined by the service.
 - a. Regularly scheduled personnel should be assigned to the service as his/her primary responsibility, and should meet all appropriate and current licensing, certification or permitting requirements for Respiratory Care Practitioners or EMT-Paramedic, or higher level.

- They must meet educational requirements specific to the medical transport service environment assigned.
- b. On an emergency/unanticipated/infrequent basis, non-scheduled personnel can be added as the second team member according to the protocols of the medical transport service as long as orientation includes in-transport treatment protocols, general aircraft and ambulance safety, emergency procedures, operational policies and infection control.
- c. Under certain infrequent conditions, the weight of the second medical attendant or equipment could potentially compromise the performance of the aircraft and the safety of the mission. Under these conditions, if only one medical attendant can accompany the patient, the following should occur:
- A written policy exists defining the conditions of density altitude and weight, and it supports the pilot's authority to make these decisions.
 - A single medical attendant should have the knowledge and medical equipment to adequately perform one-person CPR.
 - Quality management activities are in place that regularly review the patient care provided by only one medical attendant and the patient's status at the time of arrival at the **arranged** destination facility.
 - No other transport team is available in that region at the time of the transport that would be more appropriate for delivering the level of care the patient requires.

4. **An Alternative to Current Critical Care Team Composition Requirements***: As an alternative to the team composition (for example: paramedic-led teams) requirement above, the following standard and criteria describe a new way to meet compliance with the accreditation standards as a critical care team. *(See *Alternative Team Composition Requirements - Addendum A*)

01.07.02 ADVANCED LIFE SUPPORT - An advanced life support (ALS) mission is defined as the transport of a patient from an emergency department or critical care unit or scene who receives care commensurate with the scope of practice of an EMT-Paramedic. (See ALS-BLS Ground Section as applicable.)

1. The medical team must at a minimum consist of **one** certified EMT-Paramedic as the primary care provider.
 - a. There are adequate personnel to provide full coverage with EMT-Paramedics who are primarily assigned to the medical service and are readily available within the response time determined by the service (if the majority of transports are ALS missions).
2. The EMT-Paramedic providers must be licensed, certified, or permitted according to the appropriate state regulations and current relicensing, recertification, or repermitting status.
 - a. **Pre-hire qualifications require a minimum of three years ALS experience for flight paramedics.**
 - b. **Pre hire background checks include criminal background, licensing, and previous employer.**

Examples of Evidence to Exceed Compliance:

Three to five years ALS experience is required pre-hire.

3. Advanced life support missions require an additional team member, for a minimum of two medical attendants, while a patient(s) is on board. Personnel should be available for each transport within a response time

determined by the service.

- a. Regularly scheduled personnel should be assigned to the service as his/her primary responsibility and should meet all appropriate and current licensing, certification, or permitting requirements for – a Respiratory Therapist, EMT-Paramedic, or higher level.
- b. They must meet educational requirements specific to the medical transport service environment assigned.
- c. On an emergency/unanticipated/infrequent basis, non-scheduled personnel can be added as the second medical team member according to the protocols of the medical service as long as orientation includes in-flight treatment protocols, general aircraft safety, emergency procedures, operational policies, and infection control.
- d. Under certain conditions, the weight of the second medical person or equipment could potentially compromise the performance of the aircraft and safety of the mission. Under these conditions, if only one medical person can accompany the patient, the following should occur:
 - A policy exists defining the conditions of density altitude and weight, and it supports the pilot's authority to make these decisions.
 - A single medical attendant should have knowledge and medical equipment to adequately perform one person CPR.
 - Quality management activities are in place that regularly review the patient care provided by only one medical attendant and the patient's status at the time of arrival at the arranged destination facility.
 - No other transport team is available in that region at the time of transport that would be more appropriate for delivering the level of care the patient requires.

01.07.03 ALS/BLS TRANSPORTS – refer to the ALS/BLS Ground standards. BLS no longer applies to air transports as a dedicated service although one care provider is acceptable for BLS fixed wing transports or medical escort requests.

Examples of Evidence to Meet Compliance:

The program has guidelines for accepting a single provider transport (versus the regularly scheduled critical care or ALS team) and these transports are reviewed in the QM process.

01.07.04 MEDICAL ESCORT TRANSPORTS – Refer to Medical Escort Section

01.07.05 INDEPENDENT SPECIALTY CARE TEAMS—Specialty transport teams that are specifically trained for air and/or ground transport and **are not accompanied** by a transport team or team member should follow the criteria listed under critical care.

Examples of Evidence to Meet Compliance:

*Independent specialty care teams have documented evidence of annual education in in-flight and ambulance treatment modalities, altitude physiology, general aircraft and ambulance safety, and emergency procedures. For RW/FW, they must meet educational requirements for in-flight environment (reference **pg 45** Education specific to the in-flight and ground transport environment).*

01.07.06 SPECIALTY PERSONNEL WHO ARE ADDED TO THE REGULARLY SCHEDULED TRANSPORT TEAM (as for neonatal, pediatric, perinatal or IABP transports) should follow the criteria listed below:

1. Specialty care personnel must have appropriate licensure or certification requirements by appropriate agencies or governing bodies and have relevant specialty experience as described by program policy.
2. Liaison roles with the host medical transport service ensure cohesive and safe operational relationships, and well-defined roles and policies.
3. Specialty care personnel must be accompanied by **one** regularly scheduled medical personnel.
4. Specialty care personnel must be educated in in-flight and ambulance treatment modalities, altitude physiology, general aircraft and ambulance safety, and emergency procedures. For RW/FW, they must meet educational requirements for in-flight environment (reference pg. 21- Education specific to the in-flight and ground transport environment).
- 4. Pre-transport safety briefings are performed prior to each transport.**
- 5. Specialty care personnel are familiar with the program's policies, safety and survival techniques as they relate to the specific aircraft or ambulance.**

01.08.00 - STAFFING

The service must have written operational policies to address each of the areas listed below:

01.08.01. Scheduling and individual work schedules demonstrate strategies to minimize duty-time fatigue, length of shift, number of shifts per week and day-to-night rotation. *(See References in Appendix for circadian rhythm and other fatigue studies.)*

1. On-site shifts scheduled for a period to exceed 24 hours are not acceptable. Twenty-four hour shifts are acceptable if:
 - a. Medical personnel are not required to routinely perform any duties beyond those associated with the transport service.
 - b. Medical personnel are provided with access to and permission for uninterrupted rest after daily medical personnel duties are met.
 - c. The physical base of operations includes an appropriate place for uninterrupted rest.
 - d. Medical personnel must have the right to call "time out" and be granted a reasonable rest period if the team member (or fellow team member) determines that he or she is unfit or unsafe to continue duty, no matter what the shift length. There should be no adverse personnel action or undue pressure to continue in this circumstance.
 - e. Management must monitor transport volumes and personnel's use of a "time out" policy.
2. Personnel must have at least eight hours of rest (pilots must have ten hours of rest as consistent with Part 135 regulations) with no work-related interruptions prior to any scheduled shift of twelve hours or more. The intent is to preclude back-to-back shifts with other employment, commercial or military flying, or significant fatigue-causing activity prior to a shift.
3. The number of consecutive shifts and day to night rotation must be closely monitored by management for pilots/drivers, medical crews, **communication specialists**, ground ambulance drivers and **aircraft maintenance personnel**.
4. Policies should address minimum rest/duty time requirements for transports that are international or involve overnight stays, not to exceed more than 16 hours on duty in a 24-hour period OR a minimum of two medical team members to allow one member rest during the transport and insure another attends the patient. (FW)

5. Policies that address preparation for transport based on an available patient report and distance of transport (including international transports) to appropriately assess staffing and equipment/supplies needs.

6. Policies address crew interface so that team members are expected to stay alert on all legs of the transport, including at least one team member on empty legs, to assist the pilot in staying alert (especially in one-pilot operations) and the driver to stay alert for ground transports.

Examples of Evidence to Meet Compliance:

Management monitors fatigue in terms of staffing patterns, patient outcomes and incidents or accidents.

01.09.00 PHYSICAL WELL-BEING

01.09.01 Physical well-being is promoted through:

1. Wellness programs that promote healthy lifestyles (e.g. balanced diet, weight control, no smoking).

2. Evidence of an injury prevention program and ergonomic strategies to reduce employee injuries.

3. Protective clothing and dress code pertinent to:

a. Mission profile such as turn-out gear available at scene for medical personnel who assist with heavy extrication.

b. Safe operations, **which may include the following, unless specified as “required” below:**

- Boots or sturdy footwear for on-scene operations **required**.
- Wearing reflective material or striping on uniforms for night operations.
- High visibility reflective vests **or appropriate DOT approved clothing** must be worn by flight **and ground** crews according to the ANSI-SEA 107 standard **or equivalent national standard**.
- Flame retardant clothing.
- Appropriate outerwear pertinent to survival in the environment **required**.
- Flight helmets (**required** **for all crews including specialty teams** for RW operations).

4. Infection control - dress codes address jewelry, hair and other personal items of medical personnel that may interfere with patient care (**refer to OSHA standards**).

5. Written policies addressing:

a. Hearing protection requirements

b. Duty status during pregnancy

c. Duty status during acute illnesses such as sinusitis or otitis.

d. Duty status while taking medications that may cause drowsiness.

e. Weight/height and/or lifting ability as specified in pre-hire requirements.

Examples of Evidence to Meet Compliance:

Personnel are observed following the program's dress codes and are knowledgeable about policies regarding physical well-being. Pregnancy policies are consistent with current national laws and may address notification to employer requirement, written documentation requirements to continue on duty, possible alternative duty assignments if team member is restricted from flight.

01.10.00 MEETINGS, RECORDS AND POLICIES

01.10.01 Meetings

1. There are formal, periodic staff meetings for which minutes are kept on file. Minutes will include who attended, base identification (if multiple bases), who is presiding and discussion (versus agenda/topics only). There are defined methods, such as a staff notebook **or electronic mechanisms** for disseminating information between meetings.
 - a. Meeting minutes (Staff, Safety, QM meetings etc.) are kept on file and maintained for a minimum of three years.
 - b. Minutes are dated, and personnel present are clearly identified by title (e.g., Director, RN, EMT-P, RRT).

Examples of Evidence to Meet Compliance:

Meeting minutes indicate attendance and representation by all disciplines. Action items, timelines and area of responsibility are well documented and demonstrate a flow of information that indicates tracking, trending and loop closure.

01.10.02 Records Management ensures that patient care records, meeting minutes, policies and procedures are stored according to hospital or agency policies, and HIPAA **or privacy regulations** are indicative of the individual medical transport service's sensitivity to patient confidentiality **in accordance with local and national standards.**

1. A record of patient care is completed, and a copy remains (**electronic or other format**) at the receiving facility for appropriate continuity of care.
 - a. A policy outlines minimal requirements **based on the transport services scope of care** ~~for items to be documented in the patient care records~~ that includes:
 - Purpose of the transport
 - Treatments, medications, intake and output and patient's response to treatments and medications.
 - **Ventilator setting and change in ventilator settings are recorded.**
 - **Documentation of pertinent radiologic and laboratory findings in interfacility transports.**
 - Signature of each care provider and clarity about what care was performed by each provider (administering medications and performing procedures) and indicates who actually documented patient information.
 - Transport facilities (to and from) and to whom report was given to at the receiving facility.
 - Patient condition at certain predetermined altitudes.

Examples of Evidence to Meet Compliance:

Patient records are signed and initialed by the crew member who performed the treatment or procedure. Records are stored in a secure area that is inaccessible to the public with accessibility limited according to applicable HIPAA guidelines.

01.10.03 Policies - A policy manual is available and familiar to all personnel.

1. Policies are dated and signed by the appropriate manager(s).
2. Policies are reviewed on an annual basis as verified by dated manager's signature on a cover sheet or on respective policies.

Examples of Evidence to Meet Compliance:

Policies can be broken out by department/division however there must be signatures and revision dates on each specific policy or a cover sheet that represents annual review with respective review dates and signatures.

01.11.00 UTILIZATION REVIEW

01.11.01 Management ensures an appropriate utilization review process ~~(some criteria do not apply to elective transports)~~ through trending and tracking requests. There is evidence of feedback to the requesting agents and feedback from the patient-receiving facilities. Utilization review may be prospective, concurrent, or retrospective.

The following criteria may be considered **(unless specified as required)** but are not limited to:

1. Medical denials or requests that should have been denied for a specific transport mode (such as RW when ground would have been appropriate) are tracked and evaluated specific to the program's scope of care and mission. **(required)**
2. Specialized medical transport personnel expertise and/or equipment available during transport that would otherwise not be available.
3. Safety of the transport environment.
4. Cost of the transport.
 - a. Emergency transports do not require a guaranteed payment prior to transport.
 - b. Calling agents for non-emergent requests are assisted with information about the cost of the transport as well as alternative, more economical (and equally appropriate) means of transport, if available.
5. A structured, periodic review of transports (to determine transport appropriateness or that the mode of transport enhances medical outcome, safety or cost effectiveness over other modes of transport) performed at least semiannually and resulting in a written report. (required **for all three modes of transport**)
6. The following indicators may trigger a review of the record to determine the medical appropriateness of the transport based upon patients **unless specified as required:**
 - a. Who are discharged home directly from the Emergency Department.
 - b. Who are transported without an IV line or oxygen.
 - c. Upon whom CPR is in progress at referring location. **(required)**
 - d. Who are not transferred from a critical care unit.
 - e. Who are "scheduled transports."

- f. Who are air transported more than once for the same illness or injury within 24 hours. **(required)** (RW/FW)
 - g. Who are transported from the scene of injury with a trauma score of 15 or greater or fail to meet area-specific triage criteria for a critically injured trauma patient. (RW)
 - h. Who are treated at scene **or referring hospital** but not transported. **(required)** (RW)
 - i. Who are not transferred bedside to bedside by the flight team. (RW/FW)
 - j. Who are transported interfacility, and the receiving facility is not a higher level of care than the referring facility.
 - k. Who are transported from the scene of injury to any hospital which was not the closest appropriate and available trauma center (based on regional trauma plans, if present). (RW)
 - l. Who are flown initially by fixed-wing and transported from the airport to the receiving facility by helicopter. (RW/FW)
 - m. Who are ground transported with red lights and sirens. **(required)**
 - n. Who are served by an inappropriate aircraft (time/distance/speed considerations etc.) (RW/FW)
 - o. Who are served by an inappropriate team (i.e. ALS team used but patient requires critical care skills). **(required)**
 - p. Who are served by an appropriate ambulance that met the aircraft **to assume care of the patient and** continue transport with the level of care, equipment and supplies appropriate to the patient's specific needs. (RW/FW)
 - q. Patient dies during transport (required).**
7. Requests that are outsourced or subcontracted must be included in each review for appropriateness. (RW/FW)
8. Continuity of Care - The medical service must ensure continuity of care and expeditious treatment of patients.
- a. Where appropriate, the service should promote a timely feedback to referring agency, facility or physician about patient outcome and treatment rendered before, during and after transport.
 - b. Patients are only transferred to ground transport units (at sending and receiving destination) when care can be continued by the same level or higher level ground personnel as that provided by **transport** personnel and when ordered by the referring/receiving physician or medical director(s). (RW/FW)

Examples of Evidence to Meet Compliance:

UR reports indicate trending and loop closure of patient outcomes. Requesting agents are contacted if there are trends that indicate over-triage or under-triage.

Continuous review of utilization review with applicable trending and loop closure of patient outcomes in the form of follow-up to receiving facility, documented phone calls to patient/family, etc. may provide adequate information about patient outcome. Outliers should be presented to Case Review Committee or during regularly scheduled staff meetings to discuss specifics of transport.

Examples of Evidence to Exceeds Compliance:

There is written evidence that the program routinely provides feedback and education to requesting agents regarding inappropriate requests for the transport. Program regularly meets with representatives of the EMS region and trauma center to discuss scene transports that were both undertriaged and overtriaged.

01.12.00 Quality Management

01.12.01. The QM program has written, objective evidence of actions taken in problem areas and the evaluation of the effectiveness of that action.

1. A QM flow chart diagram or comparable tool is developed demonstrating organizational structure in the QM plan and linkage to **the Safety Management System.**
2. The QM Program is linked with risk management, so that concerns raised through the risk management program can be followed up through the continuous quality improvement program:
 - a. There is a written policy that outlines a process to identify, document and analyze sentinel events, adverse medical events or potentially adverse events (near misses) with specific goals to improve patient safety and/or quality of patient care.
 - b. There is follow-up on the results of actions /goals for specific events until loop closure is achieved.
 - c. The process encourages personnel to report adverse events even if it is a sole source event (only the individual involved would know about it) without fear of punitive actions for unintentional acts.
3. There is a written QM plan that **must** include but not be limited to the following components:
 - a. Responsibility/assignment of accountability.
 - b. Scope of care.
 - c. Important aspects of care, including clinical outcomes.
 - d. Operational processes such as financial outcomes and customer needs.
 - e. Indicators.
 - f. Thresholds for evaluation, which are appropriate to the individual service.
 - g. Methodology—the QI process or QI tools utilized.
 - h. Assembly of groups to address each identified area of quality concerns that represent all disciplines involved, ensuring optimal communications and problem-solving.
 - i. Emphasis on the quality of services offered on a continuing basis with constant attention to developing new strategies for improving; maintaining the status quo or achieving arbitrary goals are not considered the end-measures.
 - j. Evaluation of the improvement process.

Examples of Evidence to Meet Compliance:

The QM plan is current and describes the process with evidence of loop closure in subsequent reports. QM does not consist only of medical record reviews.

Examples of important aspects of care may be:

*Response time on emergent transports
Controlling life-threatening dysrhythmias
Managing cardiac chest pain
Managing respiratory distress
Patient and user satisfaction
Complete and accurate documentation of care delivered
Efficient turnaround time in referring hospitals on emergent transfers*

Other criteria may include:

*Communications among parties involved in transfer
Facilitating transfer of patients for referring physicians
Appropriateness of use of transport service and absence of patient/staff injuries incurred during transfer.*

Indicators may also be in regard to:

*Meeting response time
Advanced procedure success rate
Patient or employee or referring/receiving staff satisfaction
Periodic maintenance on medical equipment, communicating vehicles in/out of service
Appropriate mode use
Documentation requirements, policy/procedure compliance, etc.*

Thresholds are appropriate for the indicator and may be based on published standards/results, program historical results/goals and/or intuitive appropriateness, i.e. 100% is desired for correct referring location. However, 100% is not realistic for success on first attempt of intubation. Examples of methodologies may be sources of data such as questionnaires, databases, medical records, administrative reports, incident reports; how numerical results are calculated, fishbone diagram, six sigma, control charts, Pareto charts, flowcharts, etc.

Examples of Evidence to Meet Compliance:

Development of business indicators that will allow the Program to improve in their processes should be developed with indicators focusing on every aspect of the program (i.e. communications, clinical, aviation, safety, etc.) A flow chart outlining the process flow when outliers and how the loop is closed to ensure that each outlier was addressed. Subsequent action to trends in activity should be noted with constant evaluate of the performance improvement process (i.e. Deming Cycle, Plan Act, Do, Check). The QM plan is current and describes the process with evidence of loop closure in subsequent reports.

4. There will be regularly scheduled QM meetings providing a forum for all disciplines involved in the medical transport service.
5. The monitoring and evaluation process has the following characteristics:
 - a. Driven by important aspects of care, and operational practices identified by the medical transport service's QM plan.
 - b. Indicators and thresholds or other criteria are identified to objectively monitor the important aspects of care.
 - c. Evidence of QM studies and evaluation in compliance with written QM plan.

- d. Evidence of action plans developed when problems are identified through QM and communication of these plans to the appropriate personnel.
- e. Evidence of reporting QM activities through an established QM organizational structure.
- f. An annual summary Quality Management report is generated.
- g. Evidence of ongoing re-evaluation of action plans until problem resolution occurs.
- h. Evidence of outcome studies that minimally include airway, fluid resuscitation and adherence to ACLS, PALS and NRP guidelines.
- i. Evidence of annual goals established prospectively for the QM program that provide direction for the work groups **and indicators that are measurable.**
- j. Emphasis is on loop closure and resolution of problems within a finite time period.

Examples of Evidence to Meet Compliance:

QM goals may be educational, such as developing a particular subject content, revising orientation, improving the process to carry out on-going education/skills or recordkeeping; operational, such as improving a process or policy that isn't working well, tracking of skills/advanced procedures, developing a system of how medical equipment is shared/returned among multiple bases, employee/patient/user satisfaction; clinical, such as improving medical record documentation forms/becoming electronic, evaluating and acquiring a new item of medical equipment, expanding medical capabilities, developing a reference or resource for team members/orienteers; communications, such as improving on-going education, studying ergonomics or Communications Specialists' work stations.

6. Quarterly review should include (at a minimum, but may exceed) criteria based upon the important aspects of care/service. The following examples are encouraged:

- a. Reason for transport.
- b. Mechanism of injury or illness.
- c. Medical interventions performed or maintained.
 - Time of intervention consistently documented.
 - Patient's response to intervention documented.
 - Appropriateness of interventions performed or omission of needed interventions.
- d. Patient's outcome (morbidity and mortality) at the time of arrival at destination.
- e. Patient's change in condition during transport.
- f. Timeliness and coordination of the transport from reception of request to liftoff of aircraft or ambulance enroute time.
- g. Safety practices
 - Safety issues may be handled through the Safety Committee where a problem, incident or accident should be identified with detailed reporting and analysis of aircraft and vehicular accidents/**incidents** and resolution of issues with findings and action plans reported back to the QM committee.
 - QM personnel may collect data and refer to the Safety Committee for action and

resolution.

h. Operational criteria to include at a minimum the following quantity indicators: with upper and lower control limits as set by the program to enhance safety and quality; not to be used for punitive measures.

- Number of completed transports with benchmarks for lift-off (lower and upper control limits – for example: lift-offs under normal conditions that are slower or faster than normal parameters). **Control limits are defined by the program.** Benchmarks set by the program may be longer for night-time operations.
- Number of aborted or canceled flights/transports due to weather with evidence of tracking and trending aborts/diversions for weather that interrupt or delay the patient transport and evidence of loop closure if trends are found.
- Number of aborted or canceled flights/transports due to maintenance with evidence of tracking and trending aborts/diversions for maintenance that interrupt or delay the patient transport and evidence of loop closure if trends are found.
- Number of aborted and canceled flights/transports due to patient condition and use of alternative modes of transport.

i. In addition, the communications center **or organization** should monitor and track (at a minimum but may exceed):

- IFR/VFR. (RW/FW)
- Weather at time of request and during transport if changes occur. (RW/FW)
- **Request acceptance** to lift off times. (RW/FW)
- All aborted and cancelled transport requests – times, reasons and disposition of patient as applicable.

01.12.02 For both QM and utilization review programs, there should be evidence of reporting of results through established organizational structure to the service's sponsoring institution(s) or agency (if applicable). For both QM and utilization programs, there is direct integration of the medical transport service's activities with the sponsoring institution or agency (if applicable).

Examples of Evidence to Meet Compliance:

Outcomes from QM should drive education and training needs. Systems improvement tools are educational. The process is not punitive.

Tracking and trending lift –off times, response times and times on scene or at the referring/receiving hospital are evaluated in terms of benchmarks set by the program in order to evaluate the effectiveness of policies/procedures, training and/or equipment needs.

If flights are delayed- reasons for delays or referrals are tracked as are transport requests that are conducted by an alternate means of transport (within the same program) such as FW or Ground ambulance is used although RW was requested.

SECTION 2. – PATIENT CARE

02.01.00 MEDICAL DIRECTION

Medical Director(s)—The medical director(s) of the program is a physician who is responsible **and accountable** for supervising and evaluating the quality of medical care provided by the medical personnel. The medical director ensures, by

working with the clinical supervisor and by being familiar with the scope of practice of the transport team members and the regulations in which the transport team practices, competency and currency of all medical personnel working with the service.

02.01.01 The medical director(s) should be licensed and authorized to practice in **the location** in which the medical transport service is based and have educational experience in those areas of medicine that are commensurate with the mission statement of the medical transport service (i.e., adult trauma, pediatric, neonatal transport, etc.) or utilize specialty physicians as consultants when appropriate.

02.01.02 The medical director(s) should have experience in both air and ground emergency medical services and should have education as a medical director (*see Education Matrix*) as appropriate to the mission statement and be familiar with the general concepts of appropriate utilization of air and ground interfacility services. In addition, the medical director should be current and demonstrate competency or provide documentation of equivalent educational experiences directed by the mission statement and scope of care. Certifications are required as pertinent to the program's scope of care. If a physician is Board certified in an area appropriate to the mission and scope of the service, certifications #1., 2., 11., and 13. are optional.

Supporting Criteria

1. Advanced Cardiac Life Support (ACLS) according to the current standards of the American Heart Association **or approved equivalent.**
2. Advanced Trauma Life Support (ATLS) according to the current standards of the American College of Surgeons **or approved equivalent.**
3. Altitude physiology/stressors of flight if involved in rotor wing or fixed wing operations. (RW/FW)
4. Appropriate utilization of medical/ground interfacility services.
5. Emergency Medical Services.
6. Ground ambulance rules/regulations/driver safety course. (G)
7. Hazardous materials recognition and response.
- 8. Human Factors – Crew Resource Management – AMRM (Air Medical Resource Management). (See References in Appendix)**
9. Infection control.
- 10. “Just Culture” or equivalent education is strongly encouraged. (see References)**
11. Neonatal Resuscitation Program (NRP) according to the current standards of the American Academy of Pediatrics (AAP) and the American Heart Association (AHA).
12. Patient care capabilities and limitations (i.e., assessment and invasive procedures during transport).
13. Pediatric Advanced Life Support (PALS) according to the current standards of the American Heart Association (AHA) or Advanced Pediatric Life Support (APLS) according to the current standards of the American College of Emergency Physicians (ACEP) or national equivalent.
14. Stress recognition and management.
- 15. Sleep deprivation, sleep inertia, circadian rhythms and recognizing signs of fatigue.**
16. The medical director should demonstrate continuing education in transport.

02.01.03 The medical director(s) is actively involved in the quality management (QM) program for the service.

02.01.04 The medical director(s) is actively involved in administrative decisions affecting medical care for the service.

02.01.05 The medical director sets and reviews medical guidelines (for current accepted medical practice), and medical guidelines are in a written format.

02.01.06 The medical director(s) is actively involved in hiring, training and continuing education of all medical personnel for the service.

02.01.07 The medical director(s) is actively involved in the care of critically ill and/or injured patients.

02.01.08 The medical director receives Safety and Risk Management training on an annual basis (strongly encouraged) such as Threat and Error Management training or equivalent (see References).

Examples of Evidence to Meet Compliance:

There is evidence of the medical director's involvement with the program through meeting attendance records, education records, chart reviews etc.

Examples of Evidence to Exceed Compliance:

Medical Director(s) attends TEM and Just Culture training and achieves advanced transport management certifications such as Certified Medical Transport Executive.

02.01.09 The medical director(s) is actively involved in orienting physicians providing on-line (**in-transport**) medical direction according to the policies, procedures and patient care protocols of the medical transport service.

02.01.10 Specific policies should address diseases affected by altitude with maintenance of adequate oxygen saturation and treatment of oxygen desaturation. There is a mechanism to assure transports can be accomplished with the oxygen supply that is available according to patient needs and transport distances. Volume expansion in hollow organs should also be addressed. Policies will be consistent with principles of aeromedical physiology. (RW/FW)

02.01.11 The medical director(s) ensures that ground transport is appropriate and safe for the patient's specific disease process/needs. (For example: patients requiring use of a hyperbaric chamber are usually transported by ground, but in some geographic locations, the distance would be prohibitive for ground transport.)

02.01.12 The medical director(s) should set a policy that insures compliance with federal EMTALA regulations. This policy should address bedside-to-bedside care for ALS and Critical Care Providers to prevent any diminution in level of care. The policy should also address situations where it may not be necessary to proceed from bedside to bedside with the patient. These incidents should be examined by the QM process.

02.01.13 The medical director must maintain open communications with referring and accepting physicians and be accessible for concerns expressed by referring and accepting physicians regarding controversial issues and patient management.

02.01.14. Medical Control

1. **Medical Control Physicians**—On-line medical control physicians (who are trained and identified by the service) should have the appropriate knowledge base and experience sufficient to ensure proper medical care and medical control during transport for all patient types served by the medical transport service.

2. If the medical control physician's experience is lacking in a clinical area, he or she should seek prompt consultation as appropriate to ensure proper medical care and medical control during transport for all patient types served by the medical transport service. This consultant should be an appropriate designated physician or the patient's receiving attending physician.

3. Written policies and procedures indicate what therapies can be performed without on-line medical direction.
4. Medical control physicians are provided with triage guidelines to determine appropriate transport mode and team composition and **on-scene triage guidelines developed and accepted by the specific EMS region (see “References” in appendix) (RW)**
 - a. Triage guidelines may include provisions for auto launch*. If so, there must be a policy and evidence of review in the quality management process.

*(See Glossary in Appendix for definition of auto launch.)

Examples of Evidence to Meet Compliance:

There is a formal outline and names and dates of medical control physicians who have completed this training. There is a formal medical control schedule in place and crews are aware of who to call and how to call (i.e through Dispatch Center, etc.) in the event Medical Control is required. Additionally, formal names and documentation of respective training for all physicians considered medical control must be on file at the program with evidence of said training readily available for review.

Examples of Evidence to Exceed Compliance:

The medical director is involved in EMS on a regional and/or national basis. The medical director participates in peer-reviewed published research regarding medical transport.

02.02.00 CLINICAL CARE SUPERVISOR

Clinical Care Supervisor—Responsibility for supervision of patient care provided by the various clinical care providers (i.e., EMT-B, EMT-P, RT, RN, RCP, etc.) must be defined by the service. All patient care personnel must be supervised by someone knowledgeable and legally enabled to perform clinical supervision. The clinical care supervisor and medical director(s) must work collaboratively to coordinate the patient care delivery given by the various professionals and to review the overall system for delivery of patient care.

02.02.01 The clinical supervisor is actively involved in the QM/QA/PI of the program.

02.02.02 The clinical supervisor is actively involved in all administrative decisions affecting patient care.

02.02.03 The clinical care supervisor is actively involved in hiring, training and continuing education for all personnel who work for the service.

02.02.04 The clinical care supervisor must ensure adequate mechanisms for the evaluation of clinical practice of patient care providers.

02.02.05 The clinical care supervisor must demonstrate currency in the following or equivalent educational experiences as appropriate to the mission statement and scope of care **and/or** the clinical care supervisor must have immediate access to personnel with appropriate knowledge and experience as consultants.

1. Advanced Cardiac Life Support (ACLS) according to the current standards of the American Heart Association **or equivalent.**
2. Auditing of Advanced Trauma Life Support (ATLS) according to the current standards of the American College of Surgeons or Transport Nurse Advanced Trauma Course (TNATC) according to the standards of the Air & Surface Transport Nurses Association or equivalent.

3. Human Factors – Crew Resource Management – AMRM (Air Medical Resource Management). (See References in Appendix)

4. “Just Culture” or equivalent education is strongly encouraged.

3. Neonatal Resuscitation Program (NRP) according to the current standards of the American Academy of Pediatrics and the American Heart Association or equivalent. According to ACOG (American College of Obstetricians and Gynecologists) Standards, NRP is a required certification if medical personnel care for high-risk OB patients.)
4. Pediatric Advanced Life Support (PALS) or Advanced Pediatric Life Support (APLS) according to the current standards of the American Heart Association **or equivalent.**
5. Patient care capabilities and limitations during transport (i.e., assessment and invasive procedures).
6. Infection control.
7. Stress recognition and management.
8. Altitude physiology/stressors of flight if involved in rotorwing or fixed wing operations. (RW/FW)
9. Appropriate utilization of medical/ground interfacility services. (G)
10. Emergency Medical Services.
11. Hazardous materials recognition and response.

12. Sleep deprivation, sleep inertia, circadian rhythms and recognizing signs of fatigue.

13. Safety and Risk Management training on an annual basis (strongly encouraged) such as Threat and Error Management (TEM) training or equivalent.

Examples of Evidence to Exceed Compliance:

The clinical supervisor attends TEM and Just Culture training and achieves advanced certifications such as CEN, CCRN, CFRN, RNC, CTRN, and/or CMTE.

02.03.00 PROGRAM MANAGER – the program manager may have overall responsibility for a program or for a specific base with or without additional clinical responsibilities. (Follow criteria above if clinical responsibilities are part of the position description.)

02.03.01 The program manager must demonstrate currency in the following or equivalent educational experiences as appropriate to the mission statement and scope of care. Didactic education initially and on an annual basis should include but not be limited to:

- 1. Human Factors – Crew Resource Management – AMRM (Air Medical Resource Management). (See References in Appendix)**
- 2. “Just Culture” or equivalent education is strongly encouraged.**
- 3. Sleep deprivation, sleep inertia, circadian rhythms and recognizing signs of fatigue.**
- 4. Stress recognition and management.**
- 5. Safety and Risk Management training on an annual basis (strongly encouraged). ie Threat and Error Management training or equivalent.**
- 6. Quality Management QM/QA/PI of the program and its implication to best practices.**

7. Knowledge of FARs or national aviation authority's regulations as well as local and regional ground ambulance regulations as appropriate to scope of care.

Examples of Evidence to Exceed Compliance:

The program manager attends TEM and Just Culture training and achieves advanced certifications such as Certified Medical Transport Executive (CMTE).

02.04.00 Orientation, Training, and Continuing Education Program Requirements—A planned and structured program should be required for all regularly scheduled **critical care and ALS providers**. Competency and currency in these competencies must be ensured and documented through relevant continuing education programs/certification programs or their equivalent listed in this section.

02.04.01 The orientation, training and continuing education must be directed and guided by the transport program's scope of care and patient population, mission statement and medical direction. **A written education plan is required and updated on an annual basis.**

1. **INITIAL TRAINING PROGRAM** requirements for all full-time and part-time Critical Care and ALS Providers: Each Critical Care and ALS provider must successfully complete a comprehensive training program or show proof of recent experience/training in the categories listed below prior to assuming independent responsibility.

a. Pre-hire qualifications should include requiring experience relevant to the program's scope of care and patient population(s).

b. Initial and ongoing training need not be absolutely equivalent depending on roles in patient care for different providers as defined by the program and/or state regulations, but training must have basic equivalencies. Both medical personnel members need to be didactically trained. (For example: a paramedic or nurse may not be allowed to do a procedure by regulation, but that provider needs to be familiar with the steps in the procedure in order to assist the other provider in the performance of that procedure.)

c. Didactic Component of Initial Education should be specific and appropriate for the mission statement and scope of care of the medical transport service. Measurable objectives need to be developed and documented for each experience. The transport program will provide a basic outline of initial education that is not limited to, but must include:

- Advanced airway management.
- Altitude physiology/stressors of flight. (RW/FW)
- Anatomy, physiology and assessment for adult, pediatric and neonatal patients –as outlined within the program's scope of care and patient population. *(For example, if the program's scope of care includes all age groups of patients, then the anatomy, physiology and assessment of neonates, pediatric and adult patients must be included.)*
- Ambulance orientation/safety and procedures as appropriate.
- Cardiac emergencies and advanced cardiac critical care.
- Didactic education that is mission specific and specific to scope of care and patient population—for example:
 - Burn Emergencies (thermal, chemical and electrical)
 - Environmental emergencies.

- Equipment education – (airway, breathing and circulation equipment, defibrillators, pacemakers, monitors, IABP etc.)
 - High risk obstetric emergencies (**defined as “A transport that is directly related to pregnancy that may endanger the mother or fetus of a gestational age greater than 20 weeks. This does not include pre-existing conditions or trauma in the pregnant patient.” (Specific training guidelines can be found in References.)**)
 - Metabolic endocrine emergencies
 - Multi-trauma (chest, abdomen, facial).
 - Neonatal emergencies (respiratory distress, surgical, cardiac.) (**Reference definitions and specific training guidelines.**)
 - **Oxygen quality controls include: hazard awareness, how to read cylinder levels, basic understanding of Compressed Gas Association (CGA) connections; how to safely transport liquid oxygen cylinders (if utilized) and knowledge of cylinder durations. (as per local and national regulations. (FDA Section 211.25(a) and NFPA 53M)**
- Toxicology.
 - Disaster and triage.
 - EMS radio communications.
 - Hemodynamic monitoring devices (such as pacemakers, automatic implantable cardiac defibrillator (AICD), intra-aortic balloon pump, central lines, pulmonary artery and arterial catheters, ventricular assist devices and extracorporeal membrane oxygenation (ECMO) **as appropriate to program’s scope of care.**
 - **Highway scene safety management. (RW)**
 - Human Factors – Crew Resource Management – AMRM (Air Medical Resource Management). (*See References in Appendix*)
 - Infection control.
 - **“Just Culture” or equivalent education is strongly encouraged.**
 - Mechanical ventilation and respiratory physiology for adult, pediatric and neonatal patients as appropriate to the mission statement and scope of care of the medical transport service specific to the equipment.
 - Metabolic/endocrine emergencies.
 - Multi-trauma (chest,abdomen,facial).
 - Neonatal emergencies (respiratory,distress,surgical,cardiac)
 - Oxygen therapy – Mechanical ventilation and respiratory physiology for adult, pediatric and neonatal patients as appropriate to the mission statement and scope of care.

- Pediatric medical emergencies.
- Pediatric trauma.
- Pharmacology.
- Quality Management – Didactic education that supports the medical transport service’s mission statement and scope of care.
- Respiratory emergencies.
- Scene management/rescue/extrication.
- Sleep deprivation, sleep inertia, circadian rhythms and recognizing signs of fatigue.
- Stress recognition and management.
- **Safety and Risk Management training (strongly encouraged). Such as Threat and Error Management training or equivalent.**
- Transport vehicle orientation/safety & in-transport procedures/general vehicle safety including all types of vehicles the team may be exposed to including depressurization procedures for fixed wing (as appropriate). *

**(See References in Appendix for in-flight fire warnings from laptop battery failures and other high energy batteries.)*

d. Clinical Component of Initial Training– Clinical experiences will be based on the program’s mission, scope of care and patient population. Measurable objectives need to be developed and documented for each experience listed below reflecting hands-on experience versus observation only. **If simulation teaching/learning modalities are used as an adjunct to or substitution for clinical experiences, there must be documentation that the learning objectives were met. Simulation modalities may include the use of dynamic human patient simulators, standardized patients (trained medical actors), computerized interactive devices, virtual reality and serious gaming. Examples can be found in references. The following areas will be included for the scope of practice areas in which the team transports.**

- Critical Care. (adult, neonatal, pediatric)
- Emergency care. (adult, neonatal, pediatric)
- Invasive procedures on mannequin equivalent for practicing invasive procedures. An approved mannequin or simulator may be used.
(See Education Matrix for guidelines for use of a mannequin and HPS.)
- Neonatal intensive care.
- Obstetrics.
- Pediatric critical care.
- Prehospital care.
- Tracheal intubations.

e. Since airway management is an essential life-saving measure, and endotracheal intubation is an important aspect of airway management, the initial education and training must include no less than 5 live (animal labs are also

acceptable) cadaver or dynamic Human Patient Simulator (HPS) experience specific to age groups in program's scope of care and patient population. An experienced transport team member may show documentation that demonstrates this requirement has been previously met. Both crewmembers must be trained in airway management although license or state regulations may dictate who is allowed to intubate before and during transport. All intubations (successful or unsuccessful) must be documented and evaluated in the program's PI/QA/QM program. (See Education Matrix for guidelines regarding use of an HPS)

f. Alternative airway management will be included for all transport team members. Alternative airways should be selected and utilized based on the mission and scope of practice of the transport team. For example, a combitube **is not** appropriate for a neonatal team, but a laryngeal mask airway (LMA) may be.

2. **CONTINUING EDUCATION/STAFF DEVELOPMENT** must be provided and documented for all full-time and part-time Critical Care and ALS Providers. These should be specific and appropriate for the mission statement and scope of care of the medical transport service.

a. Didactic continuing education must include an annual review of:

- Human factors – Crew Resource Management - AMRM (Air Medical Resource Management). (See References in Appendix)
- Infection control.
- **“Just Culture” or equivalent education is strongly encouraged.**
- Sleep deprivation, sleep inertia, circadian rhythms and recognizing signs of fatigue.
- State EMS rules and regulations regarding ground and air transport.
- Stress recognition and management.
- **Safety and Risk Management training on an annual basis (strongly encouraged), such as Threat and Error Management training or equivalent.**

b. Clinical and laboratory continuing education should be developed and documented on an annual basis as pertinent to scope of care to follow. **If simulation teaching/learning modalities are used as an adjunct to or substitution for clinical experiences, there must be documentation that the learning objectives were met. Simulation modalities may include the use of dynamic human patient simulators, standardized patients (trained medical actors), computerized interactive devices, virtual reality and serious gaming. Examples can be found in references.**

- Critical care (adult, pediatric, neonatal).
- Emergency/trauma care.
- Invasive procedure labs.
- Labor and delivery.
- Skills maintenance program documented to comply with number of skills required in a set period of time according to policy of the medical transport service (i.e., endotracheal intubations, chest tubes).

➤ Since airway management is an essential life-saving measure, and endotracheal

intubation is an important aspect of airway management, no less than 1 successful live, cadaver, HPS or mannequin intubation per quarter is required for each Critical Care or ALS Provider.

- Live, mannequin or cadaver intubation experience within the scope of practice served by the medical transport service: i.e., neonates less than 28 days; children 2 to 8 years of age **and adult**.

3. COMPETENCIES - Policies ensure that clinical competency is maintained by currency in the following or equivalent training as appropriate for the position description, mission statement, and scope of care of the medical transport service. The Education Matrix – Addendum B – contains a listing of the current national and international courses that are available for educational preparation of transport crews and is intended to assist in the determination of compliance with the standards. In addition, the supporting associations are listed. These associations have websites where additional information can be obtained.

There are other courses that have been developed by programs, hospitals, local and state agencies that may be used to meet educational requirements such as the Critical Care Paramedic Course (CC-EMT). No matter what is chosen, a national course as listed below or a locally-developed course, specific objectives, content outlines and measurable outcomes need to be included in what is developed and must be submitted to CAMTS as an attachment to the PIF application and must include primary and secondary assessment, advanced physiology and advanced skills.

- a. Basic Life Support (BLS)—documented evidence of current BLS certification according to the American Heart Association (AHA) **or equivalent**.
- b. Advanced Cardiac Life Support (ACLS)—documented evidence of current ACLS according to the AHA **or equivalent**.
- c. Advanced Trauma Life Support (ATLS)—according to the American College of Surgeons - ATLS audit, ATLS for Nurses or Transport Nurse Advanced Trauma Course (TNATC) **or equivalent**.
- d. Pediatric Advanced Life Support (PALS)—or Advanced Pediatric Life Support (APLS) according to the AHA and ACEP, or equivalent education.
- e. Neonatal Resuscitation Program (NRP) according to the current standards of the American Academy of Pediatrics and the American Heart Association or equivalent. According to ACOG (American College of Obstetricians and Gynecologists) Standards, NRP is a required certification if medical personnel care for high-risk OB patients.)
- f. Nursing certifications (such as CEN, CCRN, RNC, CFRN and CTRN) pertinent to scope of care and patient population **are required for nurses who have been employed for more than 2 years. For pediatric-neonatal teams, CNPT is strongly encouraged**.
- g. Paramedic certifications (such as NREMT-P, FP-C or CCP-C) are strongly encouraged. If required in position descriptions, certifications must be current.
- h. Respiratory therapists certifications (such as RRT and NPS) are strongly encouraged. If required in position descriptions, certifications must be current. For pediatric-neonatal teams, CNPT is strongly encouraged.**

Examples of Evidence to Meet Compliance:

Initial and ongoing education is tracked and documented that includes certifications, currencies and clinical experiences. If education and clinical experiences are obtained outside the program (or by the same employer, but different department) these are documented.

Examples of Evidence to Exceed Compliance:

TEM and Just Culture courses are completed by more than 50% of the staff. Nursing and paramedic certifications are required and current for all staff.

4. INDEPENDENT SPECIALTY CARE PROVIDERS

- a. Education requirements for **Independent** Specialty Care Providers Education requirements will be similar to the initial training program for Critical Care and ALS Providers (Didactic and Clinical Components) and specific for the specialty area (i.e., neonatal vs. pediatric).
- b. Continuing education must be provided and documented for specialty care providers and should be specific and appropriate for the mission statement and scope of care of the medical transport service:
 - Didactic continuing education programs specific to the specialty.
 - Ongoing clinical experiences specific to the specialty.
 - Clinical competency must be maintained by currency in specialty education required by position description (i.e., American Heart Association/American Academy of Pediatrics, or Pediatric Advanced Life Support pertinent to appropriate specialty) **or equivalent.**

02.05.00 MEDICAL CONFIGURATION OF THE AIRCRAFT/AMBULANCE—Any in-service aircraft/ ambulance should be configured in such a way that the medical transport personnel can provide patient care consistent with the mission statement and scope of care of the medical transport service. Patient care issues are considered when choosing the aircraft or ground transport.

02.05.01 Configuration of the aircraft/ambulance interior should not compromise the ability to provide appropriate care or prevent providers from performing emergency procedures if necessary.

02.05.02 Medical transport personnel have access to the patient in order to begin and maintain basic and advanced life support treatment.

02.05.03 The aircraft/ambulance configuration allows for stabilizing the patient's airway and childbirth procedures if that is part of the service's mission.

02.05.04 The service's mission and ability **to transport two or more patients** should not compromise the airway or stabilization or the ability to perform emergency procedures on any on-board patient.

1. The aircraft/ambulance should have access for simultaneous airway management if there is a two-patient configuration.
2. For all transports, there are written guidelines describing types of patients that can be transported in a two-patient stretcher configuration if the aircraft/ambulance configuration does not allow for full access to the second patient.
3. For all transports, strict policies will address weight limitations, patient condition based on anticipated needs, and patient position in the aircraft/ambulance.
4. Policies will be written and adhered to for one or more patient transports if the interior configuration of the aircraft/ambulance does not allow for uninhibited access to one or more patients while enroute. Policies will address under what circumstances two critical patients may or may not be transported, including staffing and equipment.

02.05.05. **Airway** - There should be access and necessary space to ensure any on-board patient's airway is maintained and to provide adequate ventilatory support from the secured, seat-belted position of medical transport personnel.

1. It is strongly encouraged that seating be designed in the ground ambulance so that patient care can be rendered from a seat-belted position. **Shoulder harnesses on side facing bench seats should not be used. (reference peer reviewed research in “References”). (G)**

02.05.06 **Delivering Oxygen** - Oxygen is installed according to **national aviation and ground ambulance** regulations. Medical transport personnel can determine how oxygen is functioning by pressure gauges mounted in the patient care area.

1. Each gas outlet is clearly identified.
2. Oxygen flow can be stopped at or near the oxygen source from inside the aircraft or ambulance.
3. The following indicators are accessible to medical transport personnel while enroute:
 - a. Quantity of oxygen remaining.
 - b. Measurement of liter flow.
4. A variety of oxygen delivery devices consistent with the service's scope of care must be available.
5. Adequate amounts (for anticipated liter flow and length of transport with an emergency reserve) of oxygen must be available for every mission.
6. An appropriately secured portable oxygen tank with a delivery device must be carried on the aircraft/ambulance so that oxygen delivery is not disrupted when transferring the patient to a hospital or other receiving facility. A portable oxygen tank is never to be secured between patient's legs while aircraft or ambulance is in motion.
7. There must be a backup source of oxygen (of sufficient quantity to get safely to a facility for replacements) in the event the main system fails. For air transports, this backup source can be the required portable tank as long as the portable tank is accessible in the patient care area during flight.
8. There is appropriate storage of oxygen in the facility according to **national health and safety (in the U.S. Occupational Safety and Health Administration (OSHA) standards.**
9. Oxygen flow meters and outlets must be padded, flush mounted, or so located to prevent injury to medical transport personnel, patients or passengers.

02.05.07 **Maintaining IV Fluids**

1. IV supplies and fluids are readily available.
2. Hangers/hooks are available that secure IV solutions in place or a mechanism to provide high flow fluids if needed.
3. All IV hooks are padded, flush mounted, or so located to prevent head trauma to the medical transport personnel in the event of a hard landing in the aircraft or emergency **stop/maneuver** with the ambulance.
4. Glass IV containers are not used unless required by specific medications and are properly secured.
5. A minimum of three IV infusion pumps are on the aircraft/ambulance or immediately available for critical care transports and as appropriate to the scope of care.

02.05.08 **Medications** consistent with the service's scope of care are accessible.

1. The transport service has a method of assuring that all medications and intravenous fluids are appropriately calculated. Examples of effective methods include the use of drug calculation lists, internet based programs and pre-programmed drug delivery systems such as those found in medication pumps.

2. Medications are easily accessible.

3. Controlled substances are in a locked system and kept in a manner consistent with **local and national regulations.**

a. For services that transport medications between bases, a policy exists that assures safe and secure transport of medications between bases that is consistent with State and/or national laws. (In the U.S., there is a DEA license required for each base that stores and dispenses narcotics. A hospital pharmacy that stocks controlled substances for various locations needs a terminal distribution license, for example.)

4. Storage of medications allows for protection from extreme temperature changes if environment deems it necessary.

5. There is a method to check expiration dates of medications and supplies on a regular basis.

02.05.09 Medical supplies and equipment must be consistent with the service's mission statement and scope of care. Additionally, the following equipment must be on the aircraft/ambulance and available for all Critical Care or ALS Providers.

1. Cardiac monitoring capabilities:

a. Cardiac monitor, defibrillator and external pacemaker are secured and positioned so that displays are visible.

b. Extra batteries or power source are available for cardiac monitor/defibrillator or external pacemaker.

c. Aircraft/ambulance is configured for effective CPR.

2. Defibrillator:

a. Defibrillator is secured and positioned for easy access.

b. Semiautomatic or automatic external defibrillator may be required for some BLS Providers (where permitted as scope of care for EMT-B).

c. Pediatric paddles/**pads** available if applicable to the scope of care of the medical transport service.

3. External pacemaker on-board or immediately available as a carry-on item.

~~4. **Pulse generator (transvenous) pacemaker on-board or immediately available as a carry-on item or policy addressing arrangements to continue use of the pacemaker from the sending facility.**~~

5. Advanced airway and ventilatory support equipment:

a. Laryngoscope and tracheal intubation supplies, including laryngoscope blades, bag-valve-mask and oxygen supplies, including PEEP valves; appropriate for ages and potential needs of patients transported.

b. A mechanical ventilator (**and circuit appropriate to age and scope of care**) should be on board for critical care transports as pertinent to the scope of care of the medical transport service.

c. Equipment (for alternative airways) and protocol for management of missed airway attempts must be on board transport vehicles at all times.

d. Two suction units, one of which is portable and both of which must be required to deliver adequate suction.

e. Pulse oximetry on-board for critical care missions or immediately available for ALS.

f. End-tidal CO2 **continuous wave-form** monitoring capabilities available.

g. If inhaled nitric oxide or other inhaled gases are used, policies address the following:

- Monitoring
- Cylinder safety
- Transportation regulations
- Occupational exposure
- Equipment issues
 - Weight
 - Mounting in the vehicle
- Delivery of the drug

- Emergency procedures (for example troubleshooting for - battery failure, delivery fault, system failure)

6. Automatic blood pressure device, sphygmomanometer, doppler or arterial line monitoring capability on-board or immediately available.

7. Devices for decompressing a pneumothorax and performing an emergency cricothyroidotomy available if applicable to scope of care of the medical transport service.

02.05.10 The aircraft/ambulance design and configuration must not compromise patient stability in loading, unloading or in-flight operations.

1. The aircraft/ambulance must have an entry that allows loading and unloading without excessive maneuvering (no more than 45 degrees about the lateral axis and 30 degrees about the longitudinal axis) of the patient, and does not compromise functioning of monitoring systems, intravenous lines, and manual or mechanical ventilation.

2. A minimum of one stretcher should be provided that can be carried to the patient.

a. Aircraft stretchers and the means of securing it in-flight must be consistent with **national** aviation regulations. Ambulance stretchers must comply with state **and national** laws.

b. Policy indicates the maximum gross weight allowed on the stretcher (inclusive of patient and equipment) as consistent with manufacturer's guidelines.

c. The stretcher should be large enough to carry the 95th percentile adult patient, full length in the supine position. (estimated 95th percentile adult American male is 6 ft. and 242 **232** lbs.)

d. The stretcher should be sturdy and rigid enough that it can support cardiopulmonary resuscitation. If a backboard or equivalent device is required to achieve this, such device will be readily available.

- The head of the stretcher is capable of being elevated at least 30 degrees for patient care and comfort.

- If the ambulance stretcher is floor-supported by its own wheels, there is a mechanism to secure it in position under all conditions. These restraints permit quick attachment and detachment for patient transfer.

3. Securing the patient:

a. Patients transported by air are restrained with a minimum of three cross straps. ~~that must comply with national aviation regulations including applicable STCs.~~ (Cross straps are expected to restrain the patient at the chest, hips and knees **and must be FAA approved straps for RW/FW.**)

b. Patients that are loaded head forward must additionally be restrained with a shoulder harness restraint - (RW/FW)

c. Belt locations should be adjustable along the length of the stretcher to accommodate patients' specific medical situations (Such as pregnant patients or specific injury locations).

d. Patients under **40** pounds (**18** kg.) should be provided with an appropriately sized restraining device (for patient's height and weight), which is further secured by a locking device.

- All patients under 40 pounds must be secured in a five-point safety strap device that allows good access to the patient from all sides and permits the patient's head to be raised at least 30 degrees. Velcro straps are not encouraged for use on pediatric devices.

- If a car seat is used, it must have a **nationally approved safety sticker, such as a DOT sticker.**

e. Isolette:

- There must be some type of restraining device within the isolette to protect the infant in the event of air turbulence or poor road conditions.

- Isolette must be capable of being opened from its secured position in order to provide full access to the infant in the event of complicated airway problems or extrication from the isolette becomes necessary

02.05.11 Supplemental lighting system will be installed in the aircraft/ambulance in which standard lighting is insufficient for patient care.

1. A self-contained lighting system powered by a battery pack or a portable light with a battery source must be available.

2. **There must be adequate lighting for patient care:** Use of red lighting or low intensity lighting in the patient care area is acceptable if not able to isolate the patient care area **from effects on the cockpit or on a driver.**

02.05.12 Electric power outlet must be provided with an inverter or appropriate power source of sufficient output to meet the requirements of the complete specialized equipment package without compromising the operation of any electrical aircraft/ambulance equipment. **Extra batteries are required for critical patient care equipment.**

02.05.13 Medical transport personnel must ensure that all medical equipment is in working order and all equipment/supplies are validated through documented checklists for both the primary and backup aircraft/ambulance.

1. Equipment must be periodically tested and inspected by a certified clinical engineer.
2. Equipment inspections and records of inspections are maintained according to the program's guidelines.

02.05.14 The floor, sides and ceiling in the patient cabin of the aircraft or ambulance must be a surface capable of being cleaned and disinfected in accordance with national health and safety regulations with the appropriate disinfectant.

02.05.15 The interior of the aircraft or ambulance must be climate controlled to avoid adverse affects on patients and personnel on board.

~~1. Inside cabin must be capable of maintaining temperature ranges of no less than 60 degrees F (15.6 degrees C) and no greater than 85 degrees F (29.4 degrees C) to prevent adverse effects on the patient. (This applies when patient is on board in flight – not during take off or landing)
(See References)~~

1. Cabin temperatures must be measured and documented every 15 minutes during a patient transport. Thermometer is to be mounted inside the cabin.

2. The program has written policies that address measures to be taken to avoid adverse affects of temperature extremes on patients and personnel on board.

3. In the event cabin temperatures are less than 50 degrees F or greater than 95 degrees F, the program will require documentation be red flagged for the QM process to evaluate what measures were taken to mitigate adverse effects on the patient and crew and what outcomes resulted.

02.06.00 INFECTION CONTROL - Policies and procedures addressing patient transport issues involving communicable diseases, infectious processes and health precautions for emergency personnel as well as for patients must be current with the local standard of practice or national standards **(or in the U.S. - OSHA and as published by the Center for Disease Control (CDC)).**

02.06.01 Policies and procedures must be written and readily available to all personnel of the medical transport service.

02.06.02. There is an Exposure Control Plan consistent with national **(in the U.S. - OSHA Guidelines).**

02.06.03 Additional medical and agency resources pertinent to infection control must be identified and made available in the policy manual to all medical transport personnel, **for example, isolation precautions for specific diseases/conditions.**

02.06.04 Education programs will include the institution's/service's infection control resources, programs, policies and CDC recommendations. **In addition, initial and annual education regarding identification, management and safety related to patients with potentially infectious pathogens is documented.**

02.06.05 Infection control policies and procedures will be reviewed on an annual basis.

02.06.06 Education programs and policies regarding latex allergies may include:

1. Patients and employees at risk for latex sensitivities and symptoms manifested by an allergic reaction.
2. Maintaining a latex-safe environment.
3. Methods to minimize latex exposure to lessen risks of allergic reactions in medical personnel.

02.06.07 Preventive measures. Medical transport teams transporting patients must practice preventive measures lessening the likelihood of transmission of pathogens. Policies and procedures address:

1. Personnel health concerns and records of:

a. Pre-employment and annual physical exams or medical screening to include:

- History of acute or chronic illnesses.
- Illnesses requiring use of medications that may cause drowsiness, affect judgment or coordination.
- Immunization history—transport team members are encouraged to have tetanus and hepatitis B immunization. Measles, mumps, and rubella (MMR) immunizations are encouraged for those born after 1957.
- Weight and lifting/strength/agility testing as appropriate to policies of the service.
- Determination of whether individual is fit for duty.

b. Provide annual tuberculosis testing (purified protein derivative) **and other testings, screenings and vaccinations as consistent with current national (CDC in the U.S.) guidelines.** This includes medical personnel, pilots and mechanics.

c. International immunization history of the transport team is documented if appropriate to the scope of care.

2. Management of communicable diseases and infection control in the transport environment is outlined in policies.

a. Use of gloves, eye and mouth protection. Personal protective equipment is readily accessible in the aircraft/ambulance or issued to the medical transport team.

b. Use of safety needles and blunt or other type system to lessen the risk of needlesticks to those who come in contact.

c. Sharps disposal container for contaminated needles and collection container for soiled disposable items on the aircraft/ambulance. Policy will promote proper disposal of sharps as well as tracking and investigation of sharps that are not properly disposed.

d. Cleaning and disinfecting with appropriate disinfectant of the patient cabin/compartment area, equipment, and personnel's soiled uniforms.

e. Mechanism for identifying those at risk for exposure to an infectious disease.

f. A plan for communication between the medical transport service personnel, EMS providers, and hospital when exposure is suspected/confirmed to include what follow-up is necessary.

- Written notification should go out in an expedient manner.
- Follow-up is documented.

g. A policy for special precautions when transporting patients with known infectious diseases.

- There is also a method to verify patient's immunization history for international

transport.

- Blood specimens or other potentially infectious materials should be placed in a leakproof, sealed container during transport.
 - Disposal of contaminated materials from the aircraft or ambulance meets Federal OSHA Guidelines.
- h. Proper cleaning or sterilization of all appropriate instruments or equipment.
- i. Hand washing before and after each invasive patient intervention and after removing gloves.
- When hand washing facilities are not available, antiseptic hand cleaners or towelettes should be used.
 - If antiseptic hand cleaners or towelettes are used, hands should be washed as soon as feasible with soap and running water.
- j. Management maintains documentation related to **any potentially infectious pathogens** ~~blood-borne and airborne pathogens~~ including confidential records of exposure incidents and post-exposure **management. All transport team vaccination records** ~~follow-up, hepatitis B vaccination status and initial and on-going training for all employees.~~ **are kept appropriately.**
- k. A policy addresses access to post exposure prophylaxis (PEP) medications for HIV, meningococcal infections, etc. The PEP medications should be available in a timely manner for all team members.
- l. Where there is likelihood of occupational exposure, the following are prohibited: eating, drinking, applying cosmetics or handling contact lenses.
- m. Food and drink will not be stored where blood or other potentially infectious materials are present. If the service performs transports with long in-flight times, there should be a policy to address the nutritional needs of patients and personnel.

SECTION 3. - COMMUNICATIONS

03.00.00 The FAA Part 135 certificate holder has the responsibility and authority to make all flight release decisions. (RW/FW)

03.01.00 The certificate holder must have procedures established for locating each flight for which an FAA flight plan is not filed. (See References FAA Part 135.79 – Flight locating requirements) (RW/FW)

03.02.00 Communications equipment on the aircraft and ambulance. - All communications equipment must be maintained in full operating condition and in good repair. Ambulance communications equipment must be capable of transmitting and receiving clear and understandable voice communications to and from the base station at a reasonable distance. Radios on aircraft and ambulances (as range permits) should be capable of transmitting and receiving the following:

1. Medical direction.
2. Communications center.
3. Air traffic control (aircraft).
4. **Emergency Services** (EMS, law enforcement agencies, **fire, etc.**).

03.03.00 Pilot is able to control and override radio transmissions from the cockpit in the event of an emergency situation. (RW/FW)

03.04.00 Medical team must be able to communicate with each other during flight. Helmets with communications capabilities are required on RW.

03.05.00 If cellular phones are part of the on-board communications equipment, they are to be used in accordance with FCC regulations. (*See References in Appendix*) (RW/FW)

1. For aircraft, cellular phones must be shut off whenever the aircraft leaves the ground, and the notice according to FCC regulations should be posted in the aircraft: (RW/FW)

2. There is a policy that prohibits cell phone use (except in an emergency) and texting while operating a ground transport vehicle.

3. Ground providers whose medical director(s) has established the requirement for transmission of biomedical telemetry may utilize the cellular telephone system for such communications. Cellular phones, in addition to and not in place of the radio equipment, should not be used in the presence of pacemakers or other equipment sensitive to interference. (G)

4. Policy limits drivers' use of cellular phones and other communication devices while driving except for vital communications. (G)

03.06.00 A Communication Specialist must be assigned to receive and coordinate all requests for the medical transport service.

03.06.01 Staffing:

1. Scheduling and individual work schedules demonstrate strategies to minimize duty- time, fatigue, length of shift, number of shifts per week and day-to-night rotation.

a. Call volume and other required duties are considerations in the number of communication specialists on duty at any one time. (Programs should be able to demonstrate how they assign staffing levels, for example, **number of Communication Specialists on duty per shift relevant to the number of vehicles and teams in service.**)

b. There are relief personnel (with the appropriate training) available for periodic breaks.

c. Personnel must have at least eight hours of rest with no work-related interruptions prior to any scheduled shift of twelve hours or more. The intent is to preclude back-to-back shifts with other employment, commercial or military flying, or significant fatigue-causing activity prior to a shift.

d. On-site shifts are **routinely** scheduled for a period not to exceed **18** hours. Twenty-four hour shifts are **not** acceptable. **In addition:**

- Personnel must have the right to call "time out" and be granted a reasonable rest period if a team member determines that he or she is unfit or unsafe to continue duty, no matter what the shift length. There should be no adverse personnel action or undue pressure to continue in this circumstance.
- Management should monitor flight volumes and personnel's use of the "time out" policy to ensure that medical personnel utilize the right to call "time-out" appropriately.

2. Communications personnel are provided with an opportunity to join wellness programs offered by the medical transport service.

03.06.02 Training of the designated person should be commensurate with the scope of responsibility of the Communications Center personnel.

1. Initial training, which must include:
 - a. Medical terminology and obtaining patient information.
 - b. Knowledge of EMS—roles and responsibilities of the various levels of training –BLS/ALS, EMT/ EMT-Paramedic.
 - c. State and local regulations regarding EMS.
 - d. Familiarization with equipment used in the field and **inter-facility** setting.
 - e. Knowledge **of national** Aviation Regulations and Federal Communications Commission regulations **or equivalent** as pertinent to medical transport service. (RW/FW)
 - f. General safety rules and emergency procedures pertinent to medical transportation and flight following procedures.
 - g. Navigation techniques/terminology, flight following and map skills. This should include an understanding of GPS navigation and approaches. (RW/FW)
 - h. Understanding weather interpretation and how to retrieve current and forecasted weather to assist the pilot during a transport if other means are not in place within the organization. (RW/FW)
 - i. Types of radio frequency bands used in medical and ground EMS.
 - j. Assistance with the hazardous materials response and recognition procedure using appropriate reference materials.
 - k. Stress recognition and management to include resources for Critical Incident Stress Debriefing or other type of post critical incident counseling.
 - l. Customer service/public relations/phone etiquette.
 - m. Quality management.
 - n. Crew Resource Management (CRM) pertinent to communications.
 - o. Computer literacy and software training.
 - p. Post Accident/Incident plan (PAIP).
2. There is evidence of recurrent training and of training as policies and equipment changes occur.

Examples of Evidence to Meet Compliance:

If the FAA Part 135 Certificate Holder is not the employer of communications center staff, there is evidence of interface with training and policies that meet the Certificate Holder's operational control specifications.

3. Certifications (such as EMT, EMD, NAACS Certified Flight Communications Course **or equivalent**) are encouraged, and if required by position description, must be current.

03.06.03 Communications is part of the program's QM program and communications personnel participate in staff, safety and QM meetings. *(See page 51 for specific QM criteria for Communications Centers.)*

03.06.04 There are shift briefings conducted at the beginning of each shift to assure continuity between shifts.

03.06.05 A post flight transport debrief is conducted after each flight that includes the communications specialist. (RW/FW)

03.06.06 Formal periodic meetings (separately held or part of the program's staff meetings) are strongly encouraged for which minutes are kept on file. Minutes will include who is presiding, discussion and who was present. There are defined methods, such as a communications book **or electronic mechanisms** for disseminating minutes and information between meetings.

03.07.00 Communications policies must be in writing and include the following:

03.07.01 There is a written policy that at the time of a request, the pilot is not informed of the patient condition or age unless there are operational considerations (for example: weight, extra equipment etc.).

03.07.02 A readily accessible post accident/incident plan must be part of the flight following protocol so that appropriate search and rescue efforts may be initiated in the event the aircraft or ground ambulance is overdue, radio communications cannot be established nor location verified. There should be a written plan to initiate assistance in the event the ambulance is disabled.

1. Post accident/incident plans are easily identified, readily available, and understood by all program personnel and minimally include:

a. List of personnel (with current phone numbers) to notify in order of priority (for communication specialist to activate) in the event of a program incident/accident (for air or ground). This list should minimally include sponsoring organization individuals where applicable, risk management attorney, family members of team members, family of patient, referring hospital, receiving hospital, security (as applicable), human resources (as applicable), media relations or pre-identified individual who will be responsible for communicating with the media, state health department and other team members.

b. Notification plans include appropriate family members and support services to family members following a program tragic event.

- There must be timely notification of next of kin (*next of kin is no longer strictly defined at the federal level so the crew member determines this on a data sheet and reviews annually*).

- It is strongly recommended that:

Family assistance includes coordination of family needs immediately after the event e.g. transportation, food, lodging, memorial/burial service, condolences, initial grief support services/referrals, (usually through appointment of a family liaison).

- Continuity includes follow through with the family after the event (e.g. submission of crew to national EMS memorial service, the continuation of grief counseling and support referrals, the inclusion of families in decision-making on anniversaries/memorials, and check-ins following release of NTSB reports, **or equivalent**, etc.)

c. Consecutive guidelines to follow in attempts to:

- Communicate with the aircraft or ambulance. (RW/FW)

- Initiate search and rescue or ground support.
 - Have a back-up plan for transporting the ground ambulance patient in the event of an incident or accident and/or the ambulance is inoperable.
 - Have an aviation individual identified as the scene coordinator to coordinate activities at the crash site. (RW/FW)
- d. Preplanned time frame to activate the post accident/incident for overdue aircraft or ambulance.
 - e. A method to insure accurate information dissemination.
 - f. Coordination of transport of injured team members **to higher level of care if needed and/or back to local area.**
 - g. Procedure to document all notifications, calls, communications and to secure all documents and tape recordings related to the particular incident/accident.
 - h. Procedure to deal with releasing information to the press.
 - i. Resources available for CISD or other counseling alternatives.
 - j. Process to determine whether the program and/or component of the program (RW/FW/G/ME) will remain in service. If it is determined that the program or a component of the program will go out of service, other regional transport services, primary customers, EMS, public service groups and other applicable groups are advised.
2. An annual drill is conducted to exercise the post incident/accident plan. This drill should include pilots, medical personnel, communications personnel, mechanics and administrative personnel. Written debriefing and critique of PAIP drills should be shared with all staff members.

a. A full drill must test each of the modes of transport (if the program has RW, FW and G or combination thereof) within a three year time frame.

B, Table top drills are not considered a full drill and using an actual incident or accident as an example of a PAIP drill is not considered a full drill.

03.07.03 A general test of all emergency procedures to include fire drill, intruder on premises, catastrophic failure of the communications center, helipad mishaps, forces of nature etc. will also be conducted on an annual basis.

03.07.04 A disaster preparedness drill should be part of the general test of all emergency procedures or conducted separately as an annual drill.

Examples of Evidence to Meet Compliance:

The PIAP plan and drills to test the plan include all modes of transport performed by the program. Results of the drill are disseminated to the entire staff. A drill to test other emergency procedures as they apply to the facility is planned and documented.

03.08.00 Flight Following -Satellite tracking systems are strongly recommended for all aircraft and required for aircraft that do not have a 406 Mhz ELT. Initial coordination must be documented and continuous flight following (or initiating and following ground transport) must be monitored and documented and should consist of the following: (RW/FW)

03.08.01 Initial coordination to include communication and documentation of:

1. Time of call. (Time request/inquiry received)
2. Name and phone number of requesting agency.
3. Age, diagnosis or mechanism of injury.
4. Referring and receiving physician and facilities (for interfacility requests) as per policy of the medical transport service.
5. Verification of acceptance of patient and verification of bed availability by referring physician and facility.
6. Destination airport, refueling stops (if necessary), location of transportation exchange and hours of operation.
7. Weather checks prior to departure and during mission as needed.
8. Previous turn-downs of the mission (i.e. helicopter shopping)
9. Ground transportation coordination at sending and receiving areas.
10. Time of Dispatch (*Time medical personnel notified flight is a go, post pilot's OK of flight*)
11. Time Depart Base (*Time of lift-off from base or other site.*)
12. Number and names of persons on board.
13. Amount of fuel on board.
14. Estimated time of arrival (ETA).
15. Pertinent LZ information.
16. Time Arrive Location
(*Time aircraft/ambulance arrives at landing zone, helipad, airport or referring area*)
17. Time Depart Location
(*Time aircraft/ambulance lifts off from landing zone, helipad, or airport or leaves referring area.*)
18. Time Arrive Destination
(*Time patient transferred to receiving clinical team; in unusual circumstances, this may not be at a healthcare facility.*)
19. Time Depart Destination
(*Time left patient destination. This will be recorded for transports not ending at base.*)
20. Time Arrive Base
(*Time arrive base after call completed*)
21. Time Aborted
(*Time authorized transport is aborted/canceled after dispatch*)

03.08.02 Concluding documentation (~~which is pertinent to RW but can also be useful for FW and G services~~) for all **modes of transport** may include calculation of:

1. Call Received (*by comm. center*)
2. Dispatch (*time interval between call received and confirmed to depart*)
3. Enroute (*time interval between confirmation to depart and actual departure*)
4. At referring (*time interval between departure and arriving at scene or referring facility*)
5. At patient (*time interval between arriving at scene or referring facility and initial patient contact*)
6. Bedside time (*time interval between initial patient contact and completing packaging ready to move with the patient to the ambulance or helicopter.*)
7. Leave referring (*time interval between departing scene or hospital bedside with the patient and driving or lifting off*)
8. At receiving (*time between driving or lifting off from scene or referring facility to arriving at receiving facility*)
9. Transfer of care (*time between arriving at receiving facility and completing turn over of care*)
10. Available (*time between turn over of care and return to aircraft or ambulance and back in service*)

~~1. Response Time~~

~~(Time interval between Time of Dispatch and Arrive Location)~~

~~2. Ground Time~~

~~(Time interval between Time Arrive Location and Time Depart Location)~~

~~3. Transport Time~~

~~(Time from Time Depart Location to Time Arrive Location)~~

~~4. Total Mission Time~~

~~(Time interval between Time of Dispatch and Time Arrive Base)~~

03.08.03 Additional Criteria for Fixed Wing: Operations should be conducted using VFR flight plans minimally and IFR flight plans whenever feasible.

1. Procedures ensure that pilots use ATC radar and/or communications services whenever operating under VFR and within the service area of an ATC facility or a communications service.
2. In addition to IFR flight plans, there are procedures to notify the communications center of the specific aircraft departure time, estimated time of arrival and arrival at the scheduled destination.
3. For a fixed wing service that flies only pre-scheduled flights, an answering service may serve as the receiving point for requests for service.
 - a. Answering service personnel must be trained to obtain specific information when receiving a request to schedule fixed wing patient transportation.
 - b. The items should include but not be limited to:
 - Name and telephone number of caller
 - Patient type/condition
 - Date and time call received
 - Anticipated or scheduled date/time of departure
 - Location of patient and destination
 - c. Specific methods must be used by the answering service for contacting the medical service coordinator (or designee) to relay request information, i.e. pager numbers, telephone and/or cellular numbers.

- d. Guidelines of timely notification (less than thirty [30] minutes) should be established. Alternate procedures for notification must be in place in case the coordinator is not available to receive the request/information.
- e. An on-call roster of the medical team must be provided to the answering service. The roster includes a priority phone list of personnel to notify in the event of an emergency.

03.09.00 Flight Following and Communications During a Transport. The medical transport service should provide direct communication capabilities for parties involved in the transport, i.e., medical personnel, ground ambulance providers, to ensure rapid dissemination of information, coordination of efforts and problem solving. In each case, direct contact between the parties should be established whenever possible as follows: **(This also applies to Ground)**

1. Direct or relayed communications to communications center (while in motion) specifying locations and ETAs, and deviations, if necessary.
 - a. A sterile cockpit is maintained below predetermined altitudes so that the pilot is able to transmit and receive vital information and to minimize distractions during any critical phase of flight. No external communications are permitted by the medical team and no patient information is transmitted at this time unless radios for medical report are isolated. (RW/FW)
 - b. There is a policy/procedure for diversions from original destinations (airports, hospital landing sites, alternative scene LZ's). (RW/FW)
2. There is a written policy that addresses direct or relayed communications to the communications center to specify all takeoff and arrival times.
3. Time between each communication.
 - a. Time between each communication should not exceed 15 minutes while in flight unless a system of continuous automatic position tracking is utilized. **(or 30 minutes on ground transport)**
 - b. There is a policy to address continuous automatic position tracking, if utilized, to ensure there are also verbal communications at predetermined times. (RW/FW)
 - c. If an IFR or VFR flight plan has not been filed, time between communications should not exceed 15 minutes if a means to communicate, directly or indirectly, is available. (RW/FW)
 - d. Time between communications should not exceed 45 minutes while on the ground.
 - e. Alternate agencies are used to relay communications when direct contact is not possible.
4. There is a written policy that while the aircraft is on a mission, a dedicated communicator assigned to flight follow will be present in the communications center at all times.

03.10.00 The Communications Center must contain the following:

03.10.01 Equipment and capabilities

1. At least one dedicated phone line for the medical transport service.
2. A system for recording all incoming and outgoing telephone and radio transmissions with time recording and **immediate** playback capabilities. Recordings **must** be kept for a minimum of 90 days.

3. Capability to immediately notify the medical transport team and on-line medical direction (through radio, pager, telephone, etc.)
4. A status display with information about pre-scheduled flights/patient transports, the medical transport team on duty, weather and maintenance status.
5. Current local aircraft service area maps and navigation charts must be readily available for aviation operations. Mapping software could supplement current charts. Road maps must be available for ground transports services.
6. Seating and workstations that are ergonomically appropriate for each communications specialist on duty.

03.10.02 Policies and plans

1. Communications policy and procedures manual (that includes 11.01.07 for RW).
2. A method to keep noise and other distractions (traffic) from the communications area while the communications specialist is involved with a medical transport mission.
3. An evacuation plan that provides for continuous communications with transport personnel in the event there is a need to evacuate the communications center.

SECTION 4. – SAFETY & ENVIRONMENT

04.01.00 GENERAL SECTION

04.01.01 There is evidence that safety issues are addressed that are specific to the operational environment (i.e. weather, terrain, aircraft performance).

Examples of Evidence to Meet Compliance

Helicopters operating at density altitudes of 5000 feet and above must have higher lift capabilities than those operating at lower density altitudes.

04.01.02 The physical base or operations demonstrates an appropriate and safe work environment for all personnel with adequate lighting, ventilation, and equipment storage for patient care and care of the transport ambulance.

- 1. Oxygen storage should be 10 feet from any open flame and 20 feet from combustibles in a well ventilated area with no smoking signs posted or in accordance with national regulations. ie. (see FDA Section 211.42 guidelines in references).**

04.01.03 Aircraft/ambulance and personnel security

1. A policy addresses the security of the aircraft and/or ambulance and physical environment (i.e. hangar, fuel farm).
 - a. Security of the aircraft or ambulance if left unattended on a helipad, hospital ramp or unsecured airport or parking lot.
 - b. Training for pilots, drivers **and medical personnel** to recognize signs of aircraft/ambulance tampering.
 - c. Plan to address aircraft or ambulance tampering.

Examples of Evidence to Meet Compliance

Pilots drivers and medical personnel are able to identify signs of aircraft /ambulance tampering as outlined in an education program.

2. Personnel security - Medical team is required to carry photo IDs (driver's license is acceptable) with first and last name while on duty.

Examples of Evidence to Meet Compliance

Policy requires wearing or carrying ID's while on duty

3. Patient security
 - a. Family members or other passengers who accompany patients must be properly identified and listed by name (in compliance with HIPAA regulations) in the communications center by the transport coordinator.

04.02.00 SAFETY EDUCATION

04.02.01 Education Specific to the In-Flight and Ground Transport Environment

1. Completion of all the following educational components should be documented for each of the **flight** medical personnel. These components should be included in initial education as well as reviewed on an annual basis with all regularly scheduled, part-time or temporarily scheduled medical personnel and specialty care providers as appropriate for the mission statement and scope of care of the medical service.

- a. Medical patient transport considerations (assessment/treatment/preparation handling/equipment).
- b. Day-and night-flying protocols.
- c. EMS communications (radios) and familiarization with EMS system.
- d. Extrication devices and rescue operations (ranging from familiarity to explicit training depending on the service's mission statement) (RW).
- e. General aircraft safety. (It is strongly recommended to have the aircraft physically present when providing this training.) This training addresses: (RW/FW)
 - Aircraft evacuation procedures (exits and emergency release mechanisms). To include emergency shut down- engines, radios, fuel switches, electrical and oxygen shutdown.
 - Aviation terminology and communication procedures to include knowledge of emergency communications frequency.
 - In-flight and ground fire suppression procedures (use of fire extinguishers).
 - In-flight emergency and emergency landing procedures (i.e., position, oxygen, securing equipment).
 - Safety in and around the aircraft, including **national aviation rules** and regulations pertinent to safety for medical team members, patient(s), and lay individuals.
 - Specific capabilities, limitations and safety measures for each aircraft used, which includes specific training for backup or occasionally used

aircraft.

- Use of emergency locator transmitter (ELT).
- Minimal safety requirements on ground support ambulances used away from base for fixed wing operations, for example, adequate number and functioning seat belts for all team members, no loose equipment.

f. Ground operations.

- Landing sites.
 - On-scene requirements.
 - Hospital landing site changes or special needs review.
- Patient loading and unloading – policy for rapid loading/unloading procedures.
- Refueling policy for normal and emergency situations.

g. Hazardous materials recognition and response. *(Even if not part of the service's mission statement, personnel should be able to recognize a hazardous-materials situation if encountered.)*

h. Highway scene safety management (see references)

i. Survival training/techniques/**equipment that is pertinent to the environment/geographic coverage area of the medical service. (Includes water egress survival training if enroute travels are routinely over large bodies of water such as rivers, lakes, bay areas based on the program risk assessment).**

Examples of Evidence to Meet Compliance:

Water egress survival training should include: Hazards to aircraft and personnel during overwater operations; Pre-ditching considerations and procedures; Emergency ditching and evacuation procedures; Upright emergency evacuation; Emergency evacuation; Surface water survival and rescue water skills.

Examples of Evidence to Exceed Compliance:

Underwater escape training using full immersion/inversion dunker capable of inducing disorientation and accurately replicating the aircraft interior if traversing rivers or larger bodies of water on a regular basis. Rescue/recovery training – helicopter at sea simulation if traversing rivers or larger bodies of water on a regular basis.

2. Completion of all the following educational components should be documented for each of the ground transport personnel. These components should be included in initial education as well as reviewed on an annual basis with all regularly scheduled, part-time or temporarily scheduled personnel or specialty care providers as appropriate for the mission statement and scope of care of the ground interfacility service. (G)

- a. EMS communications (radios) and familiarization with EMS system.
- b. Extrication devices and rescue operations (ranging from familiarity to explicit training, depending on the service's mission statement).
- c. General safety. (It is strongly recommended to have the ambulance physically present when providing this training.) This training addresses:
 - Ambulance evacuation procedures (exits and emergency release mechanisms).

- Fire suppression procedures (location and use of fire extinguishers).
 - Patient loading and unloading procedures.
 - Refueling procedure with patient(s) on board.
 - Use of road hazard equipment.
 - Specific capabilities, limitations and safety measures for each ambulance used, which includes specific training for backup or occasionally used ambulances.
- d. Hazardous materials recognition and response.
- e. Survival training/techniques/equipment that is pertinent to the environment/geographic coverage area of the medical transport service but must include at a minimum:
- **Safety and survival equipment requirements**
 - **Smoke in the cockpit/cabin, firefighting in the cockpit/cabin**
 - **Emergency evacuation of crew(s) and patient(s) and in addition:**
 - **The program should assess risks when flying over bodies of water (in terms of frequency) and provide water egress survival training at least initially and periodically as appropriate to the frequency of flying over bodies of water.**

04.02.02 Community Outreach Safety Program

1. The medical service should facilitate integration of all emergency services and transport modalities by supporting joint continuing education programs and operational procedures to include but not be limited to:
 - a. Hazardous materials recognition and response.
 - b. Disaster response/triage.
 - The medical transport service should be integrated with and communicate with other public safety agencies, including ground emergency service providers. This may include participation in regional quality improvement reviews, regional disaster planning and mass casualty incident drills that include an integrated response to terrorist events.
 - There is a response plan to all types of disaster, including weapons of mass destruction, terrorist events and natural disasters.
 - There is a policy that prohibits “freelance responses” (responding without being specifically requested) to disasters.
 - All personnel are familiar with the plan to respond to disasters.
 - **FEMA or other Emergency Management classes for scene and disaster response.**
2. Interface of the medical team with other regional resources.
 - a. **For services that respond to incident scenes and support disaster response, staff have completed the Federal Emergency Management Agency Independent Study Courses on Incident Command.**

(See References)

b. For services that are involved in national disaster response, management staff should also have completed IS-800b. – National Response Framework, An Introduction.

3. A planned and structured safety program must be provided to public safety/law enforcement agencies and hospital personnel who interface with the medical service that includes: (RW)

- a. Identifying, designating and preparing an appropriate landing zone (LZ).
- b. Personal safety in and around the helicopter for all ground personnel.
- c. Procedures for day/night operations, conducted by the medical team, specific to the aircraft:
 - High and low reconnaissance.
 - Two-way communications between helicopter and ground personnel to identify approach and departure obstacles and wind direction.
 - Approach and departure path selection.
 - Procedures for the pilot to ensure safety during ground operations in a LZ with or without engines running.

4. Crash recovery procedures specific to the aircraft make and model should minimally include:

- a. Location of fuel tanks.
- b. Oxygen shut-offs in cockpit and cabin.
- c. Emergency egress procedures.
- d. Aircraft battery – stay away from it.
- e. Emergency shut-down procedures.

5. Education regarding “weather shopping” should be included.

6. Records are kept of initial and recurrent safety training of prehospital, referring and receiving ground support personnel.

04.03.00 EQUIPMENT AND OPERATIONS AROUND THE AIRCRAFT/AMBULANCE

(For medical configuration see Section 02.05.00)

04.03.01 The aircraft/ambulance configuration and patient placement allows for safe medical personnel egress.

1. Doors must be fully operable from the interior.
2. Doors must be capable of being opened fully and held by a mechanical device.

04.03.02 Aircraft/ambulance operational controls and communications equipment are physically protected from any intended or accidental interference by the patient, medical transport personnel, or equipment and supplies.

04.03.03 Lighting, electric power sources and communications equipment.

1. In an aircraft, a means to protect the pilot's night adaptation vision should be provided for night operations, either through the medical configuration or by a dividing curtain. (RW/FW)
2. In an ambulance, the interior lighting includes an overhead or dome light that is configured so as not to cause reflection and impair the driver's vision while driving. (G)
3. Electric power outlet and/or invertors required for specialized medical equipment should not compromise the operation of any electrical aircraft/ambulance equipment.
4. Medical or communications equipment will be functional without interfering with the avionics and the avionics should not interfere with function of medical equipment on the aircraft. Medical or communications equipment will be functional on the ambulance without interfering with the mechanical components of the ambulance or vice-versa.

04.03.04 Head-strike envelope:

1. The interior modification of the aircraft is clear of objects/projections OR the interior of the aircraft is padded to protect the head-strike envelope of the medical personnel and patients as appropriate to the aircraft. (FW)
2. The head-strike envelope in the ambulance should be clear of hard objects that could cause injury in the event of poor road conditions or sudden stops. (G)
3. Helmets are required for rotorwing operations. Helmets for crewmembers must be appropriately fitted and maintained according to the program's manufacturer's criteria or program's policy. (RW)

04.03.05 Securing equipment and supplies - All aircraft equipment (including specialized equipment) and supplies must be secured according to **national** aviation regulations. (Use of bungee cords is not considered appropriate when securing equipment and supplies). Ambulance equipment must be secured by an appropriate clamp, strap, or other mechanism to the vehicle or stretcher/isolette to prevent movement during a crash or abrupt stop.

04.03.06 Aircraft/ambulance equipment

1. Night vision goggles are strongly encouraged for programs conducting rotorwing night operations.

If night vision goggles (NVGs) are used by the service, a policy addresses use of night vision goggles by personnel on board, and training is documented for personnel involved. (RW)

- a. The certificate holder must have Operations Specifications approved by national aviation regulations indicating authorization for operations utilizing night vision devices.
 - b. The training program must be approved by national aviation regulations and will specify initial qualifications and currency requirements.
 - c. If NVGs are used to the ground, the pilot ~~and one team member~~ must be trained and authorized to use the NVGs. **In addition, it is strongly encouraged that one team member be trained and authorized to use the NVGs.**
 - d. If NVGs are used only by medical personnel, crew coordination must be outlined by policy, and appropriate training must be documented.
2. The **helicopter** must be equipped with a 180 degree controllable searchlight capable of at least 400,000 candle power. (RW)
 3. **The aircraft must either have a 406 Mhz emergency locator transmitter (ELT) or must be monitored at 3 minute intervals or less by a satellite tracking system. (RW)**

If using the satellite tracking system and the aircraft has not been upgraded to a 406 Mhz ELT, a 121.5 Mhz ELT should not be disarmed because it may be monitored by other aircraft.

4. The aircraft must be equipped with a functioning radar altimeter. (RW)

a. If the radar altimeter is inoperable, the Certificate Holder has policies and procedure that address operations with an inoperative radar altimeter.

5. It is strongly encouraged to install the following on helicopters (reference NTSB recommendations): (RW)

a. HTAWS

b. Flight data recording devices

c. Flight control stabilization system for single pilots operations

6. It is strongly encouraged that ambulances be equipped with safety technology such as real-time feedback mechanisms, event-recording cameras, speed governors and/or weather alert systems. (G)

Examples of Evidence to Exceed Compliance:

*All in service **helicopters** aircraft are equipped with NVGs, TAWS, Flight data recorders and autopilots. (If collecting FOQA (Flight Operations Quality Assurance- data is reported to the air medical program) All in service ambulances are equipped with real-time feedback mechanisms or video recorders.*

7. The aircraft/**ambulance** must be equipped with survival gear appropriate to the coverage area and the number of occupants.

a. Survival gear will be maintained appropriately per written policy and should be available to personnel on board.

b. A written policy must be in place regarding checking survival kit contents and expiration dates on timed supplies.

8. A fire extinguisher must be accessible to medical transport personnel and pilot(s) or driver while in motion.

9. "No smoking" signs are prominently displayed inside the cabin or ambulance.

04.03.07 There is a policy and **an operations risk profile** that addresses back-up aircraft to include: (RW/FW)

1. Checklists for medical configuration pertinent to the program's scope of care and patient population.

2. Which personnel are responsible for checking and ensuring the aircraft is ready for patient transports before the aircraft is put into service.

3. Realistic time frame to perform a maintenance check before the aircraft is put into service.

04.03.08 **Use** of occupant restraint devices:

1. **Air** medical personnel must be in seat belts (and shoulder harnesses if installed) that are properly worn and secured for all takeoffs and landings according to national aviation regulations. A policy defines when seat belts/shoulder harnesses can be unfastened. (RW/FW)

2. Ambulance personnel must be seat belted when the ambulance is in motion unless emergent patient condition precludes it. (G)

a. Front seat occupants must always be belted.

b. Overhead grab rails must be present in the patient care area.

c. It is strongly encouraged to have forward and aft facing individual seats. Side facing bench seats not recommended. If the ambulance has side facing bench seats, seat belt mountings must be

situated at the pelvic level in order to restrain personnel/passengers. **Shoulder harnesses should not be used on side facing bench seats (see references).**

04.03.09 A written policy describing patient loading and unloading procedures for medical transports as follows:
(RW/FW)

1. Specific policies concerning circumstances for rapid patient loading or unloading if practiced.
2. An established policy to ensure that the pilot is notified of any add-on equipment for weight and balance considerations.

04.03.10 Refueling policies for normal and emergency situations (**for fuel systems see 05.10.00 and 06.10.00**):

1. For aircraft/ambulance, refueling with the engine running, rotors turning, and/or passengers on-board is not recommended. However, emergency situations of this type can arise. Specific and rigid procedures should be developed by the certificate holder to handle these occurrences. Such "rapid refueling" procedures will be covered by the certificate holder's training program. Refueling policies should address:

- a. Refueling with engine(s) running or shut down.
- b. Refueling with medical transport personnel or patient(s) on board, which includes a requirement that at least one medical transport person remain with the patient at all times during refueling or stopover.
- c. It is strongly encouraged to allow rapid refueling only if the location of the refueling port does not block patient and crew egress in the event of a fire or other emergency while refueling.**
- d. Fire hazard policies pertinent to refueling procedures are addressed in the certificate holder's Operations Specifications Manual.

04.03.11 The Program/**Certificate Holder Operator** has policies that govern operational limitations with specific equipment inoperative - for example if the searchlight is not functioning. If Night Vision Goggles are used, the policy should be appropriate to that specific mode of operation.

04.03.12 Specific policy to address the combative patient.

1. Additional physical and/or chemical restraints should be available and used for combative patients who potentially endanger themselves, the personnel or the aircraft/ambulance.
2. A policy should address refusal to transport patients, family members or others who may be considered a threat to the safety of the transport and/or medical transport personnel.

04.03.13 Written policy to address response to hazardous materials requests or unanticipated contact with hazardous materials.

1. There is an outlined plan of action according to pre-established policies with appropriate training of the medical transport team.
2. A plan for patient decontamination procedures prior to transport, including removal of patient clothing and other decontamination procedures for saturation of gasoline or other hazardous chemicals.
3. The medical transport team must be fully informed about the nature of the hazardous materials.
4. A list of contaminated materials, which could pose a threat to the medical transport team or render transport inappropriate, must be readily available.
5. The LZ or aircraft operational area must be a safe distance to avoid any downwind danger when approaching

or departing. (RW)

6. A policy addressing carry-on baggage of patient or passenger that must be **physically inspected** for hazardous materials that could endanger the medical transport team or compromise safety (such as weapons, sharp objects, chemicals, and obvious contaminated materials) before loading on the transport aircraft/ambulance.

7. A policy addresses the presence of firearms on the transport vehicle.

04.04.00 Safety Management System - Management is responsible for a Safety Management System (*See References in Appendix*) but management and staff are responsible for making operations safer.

04.04.01 The Safety Management System is proactive in identifying risks and eliminating injuries to personnel and patients and damage to equipment.

04.04.02 A Safety Management System includes:

1. A statement of policy commitment from the accountable executive.
2. A non-punitive system for employees to report hazards and safety concerns.
3. A system to track, trend and mitigate errors or hazards.
4. A system to track and document incident root cause analysis.
5. A Safety Manual.
6. A system to audit and review organizational policy and procedures, on going safety training for all personnel (including managers), a system of pro-active and reactive procedures to insure compliance, etc.

04.04.03 There is evidence of management's decisive response to non-compliance in adverse safety or risk situations.

1. Senior management should establish a process to identify risk escalation to ensure that safety and risk issues are addressed by the appropriate level of management up to and including the senior level.
2. Operational Risk Assessment tools should include but not be limited to issues such as: transport acceptance (**that includes tools for assessing pilot/driver and crew alertness and fatigue**), aviation decision making, mission acceptance – medical decision making, search and rescue, public relations **events**, training, maintenance and re-positioning **events**.

04.04.04 The program has a process to measure their safety culture by addressing:

1. Accountability – employees are held accountable for their actions.
2. Authority – those who are responsible have the authority to assess and make changes and adjustments as necessary.
 - a. Standards, policies and administrative control are evident.
 - b. Written procedures are clear and followed by all.
 - c. Training is organized, thorough and consistent according to written guidelines.
 - d. Managers represent a positive role model promoting an atmosphere of trust and respect.
3. Professionalism – as evidenced by personal pride and contributions to the program's positive safety culture.

4. Organizational Dynamics.

- a. Teamwork is evident between management and staff and among the different disciplines regardless of employer status as evidenced by open bi-directional and inter-disciplinary communications that are not representative of a “silo” mentality.
- b. Organization represents a practice of encouraging criticism and safety observations, and there is evidence of acting upon identified issues in a positive way.
- c. **Organization** values are clear to all employees and embedded in everyday practice.

Examples of Evidence to Meet Compliance

The Safety Management System includes the criteria defined in the International Helicopter Safety Team (IHST) tool kit or equivalent. (RW/FW)

5. A Safety Management System includes all disciplines and processes of the organization. A Safety Committee is organized to solicit input from each discipline and should meet at least quarterly with written reports sent to management and kept on file as dictated by policy.
 - a. Written variances relating to safety issues will be addressed in Safety Committee meetings.
 - b. The committee will promote interaction between medical transport personnel, communications personnel, pilots, mechanics and drivers addressing safety practice, concerns, issues and questions.
 - c. There is evidence of action plans, evaluation and loop closure.
6. There should be a designated safety person for an air transport service. Ground transport services that are not affiliated with an air transports service should also have a designated safety person.
7. The Safety Committee is linked to CQI and risk management.
8. Aviation and ambulance related events are identified and tracked to minimize risks.
(See Glossary in Appendix for definition of event.)
 - a. Medical transport services are required to report aviation and ground ambulance accidents to CAMTS and strongly encouraged to report incidents to the CONCERN network and must report to the appropriate government agencies. There is a written policy that addresses reporting incidents or accidents and assigns certain individual(s) with the responsibility to report.
(See Glossary in Appendix for definitions of accident and incident.)

04.04.05 Flight Data Monitoring Program – A flight data monitoring program is required if a flight data recorder is on the aircraft. The flight data monitoring program is a systematic method of assessing, analyzing and acting upon information obtained from flight data to identify and address operational risks before they lead to incidents or accidents. (RW/FW)

Examples of Evidence

The IHST tool kit or similar criteria provides guidance for a flight data monitoring program for both rotorwing and fixed wing. (RW/FW)

SECTION 5. - ROTORWING STANDARDS

05.00.00 CERTIFICATE OF THE AIRCRAFT OPERATOR—Certificate holder must meet all Federal Aviation Regulations (FARs) or national/international regulations specific to the operations of the medical service in the

country of residence, as applicable. This includes a FAR Part 135 Certificate (public service medical transport agencies are included in this requirement) or pertinent operating certificate if outside of the U.S., and Ambulance Operations Specifications specific to EMS operations. The transport service demonstrates compliance with the legal requirements and regulations of all local, state and federal agencies under whose authority it operates.

05.01.00 ALL “PATIENT TRANSPORT-~~MISSION~~-FLIGHTS”* must be conducted under FAA Part 135 regulations for weather minimums and flight crew duty time limitations.

**Patient ~~transport-mission~~ flight is defined as any flight segment conducted by rotor or fixed wing equipment that is necessary for transporting patients and the medical teams required to care for such patients. Flight segments included in this definition are: flights for refueling and repositioning for a specific patient transport (including organ donor transports); picking up and returning medical teams to an assigned base; the actual flight segment involving patient movement; and any time medical teams are on board.*

05.02.00 VFR WEATHER MINIMUMS should be specified for day and night local, and day and night cross country.

05.02.01 The “local flying area” should be well defined by geographic or man made features and limited to those areas **as defined by the certificate holder and as consistent with FAA Operations Specifications or other national authority.**

05.02.02 Cross country flights are those outside of the local flying area.

05.02.03 There is a system for obtaining pertinent weather information. The pilot in command (PIC) is responsible for obtaining weather information according to policy that should address at a minimum:

1. Routine weather checks.
2. Weather checks during marginal conditions.
3. Weather trending.

05.02.04 Communication between pilots, medical personnel, and communication specialists at shift change regarding the most current and forecasted weather is part of a formal briefing.

05.02.05 VFR "response" weather minimums— Must meet or exceed as outlined in FAA A021 (table below).

	Non Mountainous		Mountainous	
CONDITION	Local	Cross Country	Local	Cross Country
Day	800’ – 2 mile <i>Or 244 meters – 3.2 kilometers</i>	800’ -3 miles <i>Or 244 meters 4.8 kilometers</i>	800’ -3 miles <i>Or 244 meters 4.8 kilometers</i>	1000’-3 miles <i>Or 305 meters 4.8 kilometers</i>
Night– With NVGs or TAWS	800’-3 miles <i>Or 244 meters 4.8 kilometers</i>	1000’ – 3 miles <i>Or 305 meters 4.8 kilometers</i>	1000’ – 3 miles <i>Or 305 meters 4.8 kilometers</i>	1000’ -5 miles <i>Or 305 meters 8.0 kilometers</i>
Night <u>Without</u> NVGs or TAWS	1000’ – 3 miles <i>Or 305 meters 4.8 kilometers</i>	1000’- 5 miles <i>Or 305 meters 8.0 kilometers</i>	1500’ – 3 miles <i>Or 457 meters 4.8 kilometers</i>	1500’ – 5 miles <i>Or 457 meters 8.0 kilometers</i>

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1. Minimums are never to be considered as mandatory launch criteria. All factors are to be considered by the pilot who has final authority over a “go-no go” decision. However, any team member who is uncomfortable with launching on or continuing flight into conditions perceived as hazardous has the absolute right to request the pilot return to safer conditions immediately or as soon as possible under IMC conditions.
2. Policies include provisions for patient care and transport alternatives in the event that the aircraft must use alternate landing facilities due to deteriorating weather.

05.02.06 There is a policy designed to discourage ‘shopping’ by first responders and other requesting agents that specifically addresses how the program interfaces with other air medical services in the same coverage area to alert them of a weather turn-down. It is recognized that programs in a common geographic area may experience differing weather conditions and that programs may have differing capabilities. However, programs that turn down a request due to weather should:

1. Ask the requesting agent if another flight program had turned down the request.
2. Notify the requesting agent that the programs in their coverage area share weather information and turn-downs for safety reasons.
3. Notify other programs within their coverage area of the turn-down as soon as possible.
4. Provide the on duty pilot with contact information from other programs for questions about the weather concerns and details (fog, precipitation, wind, etc.).
5. Inform the on-duty pilot immediately if notified of a weather turn-down by another program.
6. Have written evidence of tracking the requests turned down for weather and of participation in regional notification systems as described in 1. through 5. above.

05.02.07 A policy of the certificate holder specifies an appropriate training program for new pilots based on the pilot's experience, flight time, local environment and personal adaptation. An evaluation tool applied individually to each new pilot should define the time frame. Strong consideration should be given to higher weather minimums for new and relief pilots.

05.03.00 IFR WEATHER ISSUES - When transitioning to an off-airport site after an instrument approach, the following should apply:

05.03.01 Local VFR weather minimums should be followed if within a defined local area and if the route and off-airport site are familiar.

05.03.02 Cross country VFR weather minimums should be followed if not in defined local area or if the pilot is not familiar with route and off-airport site.

05.04.00 PILOT STAFFING

There should be a minimum of four (4) flight-ready pilots permanently assigned per single-pilot aircraft that is available 24 hours a day. Temporary staffing by fewer pilots is permitted for no more than **six 6** months while finding and training a replacement pilot provided such staffing assures FAA crew rest requirements. No fewer than six permanently assigned pilots are required for two-pilot operations at a service that is available 24 hours a day. It is encouraged to have eight (8) pilots or four (4) two-pilot crews for two-pilot operations at a service that is available twenty-four hours a day. This will be pro-rated for services that fly less than 24 hours per day.

05.04.01 Scheduling practices reflect consideration for minimizing duty-time fatigue, length of shift, number of shifts per week, and day-to-night rotation.

05.04.02 Physical well-being is promoted by the employer wellness programs to include but not be limited to balanced diet, weight control, no smoking.

05.04.03 Operations facilities should include a quiet area for flight planning, training, and record-keeping.

Examples of Evidence to Exceed Compliance:

Two-pilot crews at night or on 24 hours

05.05.00 PILOT DETERMINES THAT THE AIRCRAFT IS IN AIRWORTHY CONDITION

and that appropriate pre-flight, takeoff and landing procedures are followed.

05.05.01 Prior to the first flight **or** shift of duty, the pilot:

1. Verifies that maintenance is not due on the aircraft.
2. Performs a pre-flight inspection according to the manufacturer's checklist.

05.05.02 Operational practices also include:

1. A walk-around inspection of the aircraft prior to each takeoff.
2. Establishing contact (when possible) between the pilot and ground units securing an unprepared landing site before the landing occurs.
3. Coordinating arrangements for the pickup or delivery of a patient at private or hospital helipads at least 15 minutes prior to landing.

05.06.00 Pilot in Command Qualifications.

05.06.01 The pilot must possess at least a commercial rotorcraft-helicopter and instrument helicopter rating.

05.06.02 The pilot must possess 2000 total flight hours with a minimum of 1500 helicopter flight hours prior to assignment with a medical service with the following stipulations:

1. At least 1000 of those hours must be as PIC in rotorcraft.
- 2. 100 hours unaided (if pilot is not assigned to an NVG base/aircraft)**
- 3. 100 hours unaided, (or) 50 hours unaided as long as the pilot has 100 hours aided (if assigned to an NVG base/aircraft).**
4. A minimum of 500 hours of turbine time—1000 hours of turbine time strongly encouraged.

05.06.03 ATP certificate and instrument currency is strongly encouraged.

Examples of Evidence to Exceed Compliance:

All pilots are ATP rated.

05.06.04 Pilot training requirements.

1. Initial training should, at a minimum, consist of the following and be verified by written criteria, outlines or curriculum. **Use of FAA approved training devices and simulators (aircraft appropriate) are strongly encouraged along with mission specific scenario-based training.**

- a. Terrain and weather considerations specific to the program's geographic area.
- b. Orientation to the hospital or health care system associated with the medical service.
- c. Orientation to infection control, medical systems installed on the aircraft and patient loading and unloading procedures.
- d. Orientation to the EMS and public service agencies unique to the specific coverage area.
- e. Instrument Meteorological Conditions (IMC) recovery procedures conducted solely by reference to instruments every six months at a minimum or IFR currency.
- f. IFR currency is encouraged.

g. Controlled Flight into Terrain (CFIT) prevention training for day or night operations that includes FAA guidelines or pertinent national guidelines for acceptable vertical and lateral deviation limits from the proposed enroute course and altitude based on terrain and obstructions.

h. 50% of the recommended training hours should be conducted at night.

i. Minimum requirements for specific training in aircraft type:

- Factory school or equivalent (ground and flight).
- 5 hours as pilot in command or at the controls prior to EMS missions if transitioning from a single to a single; from a twin to a single; or from a twin to a twin.
- 10 hours as pilot in command or at the controls prior to EMS missions if transitioning from a single to a twin engine aircraft.

j. Minimum requirements for area orientation:

- 5 hours area orientation of which two hours must be at night as pilot in command or at the controls prior to EMS missions.
- Training hours in aircraft type and area orientation may be combined depending on the experience and background of the pilot.

k. Air Medical Resource Management (AMRM), consistent with **national aviation regulations**, ie. FAA Advisory Circular No. 120-51E, 2004 and FAA AC 00-64. **(Interactive courses strongly encouraged)**

Specific content of AMRM training and organization of topics should reflect an organization's unique culture and specific needs, such that curriculum topics may include, but not be limited to:

- Communications Processes and Decision Behavior
 - Briefings

- Inquiry/advocacy/assertion
- Crew self-critique re: decisions and actions
- Conflict resolution
- Communications and decision making
- Team Building and Maintenance
 - Leadership/followership/concern for tasks
 - Interpersonal relationships/group climate
- Workload Management and Situation Awareness
 - Preparation/planning/vigilance
 - Workload distribution/distraction avoidance
 - Individual factors/stress reduction

2. Recurrent training minimally includes the following and is verified by written criteria, outlines or curriculum. Use of national aviation regulations, ie. FAA approved training devices and scenario-based simulators are strongly encouraged along with mission specific scenario based training for recurrent training cycles.

- a. **National aviation regulations**, ie. FAR Part 135 (135.297 and 135.299) training requirements.
- b. IMC recovery procedures annually.
- c. Flight by reference to instruments every six months or IFR currency if operating IFR.

d. CFIT prevention training for day or night operations that includes FAA guidelines or pertinent national guidelines for acceptable vertical and lateral deviation limits from the proposed enroute course and altitude based on terrain and obstructions.

e. Annual recurrent training should also include:

- Local routine operating procedures.
- Area terrain hazards.
- Review of landing sites at referring and receiving hospitals or any operational changes.
- Scene operations procedures.
- Review of landing sites at referring and receiving hospitals or any operational changes.
- Scene operations procedures.

f. Air Medical Resource Management (AMRM), consistent with **national aviation regulations**, ie. FAA Advisory Circular No. 120-51E, 2004 and FAA AC 00-64.

Specific content of AMRM training and organization of topics should reflect an organization's unique culture and specific needs, such that curriculum topics may include, but not be limited to:

- Communications Processes and Decision Behavior
 - Briefings
 - Inquiry/advocacy/assertion
 - Crew self-critique re: decisions and actions
 - Conflict resolution
 - Communications and decision making

- Team Building and Maintenance
 - Leadership/followership/concern for tasks
 - Interpersonal relationships/group climate
- Workload Management and Situation Awareness
 - Preparation/planning/vigilance
 - Workload distribution/distraction avoidance
 - Individual factors/stress reduction

g. Annual review of infection control, medical systems and installations on the aircraft, patient loading and unloading procedures.

Examples of Evidence to Exceed Compliance:

All pilots undergo initial and annual scenario-based simulator training.

05.07.00 Relief Pilot – A planned and structured orientation must be provided to the relief pilot with criteria to be based on the mission statement. **The pilot must have the same qualifications and limitations as a new pilot.**

05.07.01 The orientation must, at a minimum, contain:

1. Role responsibilities.
2. Area, weather, terrain, **aircraft** and program-specific orientation.

05.07.02 Currency should be determined prior to the beginning of operations **and there is a risk assessment tool to identify the risks at a specific base such as area and terrain, weather and program-specific idiosyncrasies.**

05.08.00 MAINTENANCE

05.08.01. Training- There must be a mechanic primarily assigned to each specific aircraft who must be appropriately qualified to maintain the aircraft operated by the medical service and who possesses two years of rotorcraft experience as a certified airframe and powerplant mechanic prior to assignment with the medical service.

1. The mechanic primarily assigned to a specific aircraft must be factory schooled or equivalent in an approved program on the type specific airframe, the powerplant and all related systems. The primarily assigned mechanic provides direct (on-site during maintenance) supervision to other mechanics assisting with maintenance that may not have this level of experience or training.
2. All mechanics should receive formal training on human factors and maintenance error reduction.
(See References in Appendix)
3. A policy is written that grants the mechanic permission (without fear of reprisal) to decline performing any maintenance critical to flight safety (that he has not been appropriately trained for), until an appropriately trained mechanic is available to directly supervise or assist.
4. Annual review of infection control, medical systems and installations on the aircraft, patient loading and unloading procedures for all mechanics.
5. At least one technician is available for each service with formal training on the aircraft electrical system and formal training on the autopilot system.
6. Training related to the interior modification of the aircraft:

- a. Should prepare the mechanic for inspection of the installation as well as the removal and reinstallation of special medical equipment.
- b. Includes supplemental training on service and maintenance of medical oxygen systems and a policy as to who maintains responsibility for refilling the medical oxygen systems.

05.08.02 Staffing - A single mechanic on duty or on call 24 hours a day should be relieved from duty for a period of at least 24 hours during **any seven** consecutive days, or the equivalent thereof, within any one calendar month. In addition:

1. It is strongly encouraged that mechanics should not be permitted to work more than 14 continuous hours.
2. Following extended maintenance such as 12–14 continuous hours, it is strongly recommended that a mechanic be scheduled for **eight** hours of uninterrupted rest.
3. 1.5 mechanic full-time equivalents are encouraged for a 24 hour aircraft. For more than one aircraft, staffing should be appropriate to the hours the aircraft are in service, the availability of backup or on-call mechanics and the number of bases necessitating travel time.
4. Back-up personnel should be provided to the mechanic during periods of extensive scheduled or unscheduled maintenance or inspection. Complexity of the aircraft and an increased number of flight hours may be considerations for increased mechanic staffing.

05.08.03 Maintenance Facilities

1. There must be a mechanism/procedure for alerting flight and medical personnel when the aircraft is not airworthy.
2. A hangar or similar-type facility should be available during inclement weather and for the mechanic to perform heavy maintenance. (Heavy maintenance is generally described as removal and installation of any component that requires a lift device or inspections that require **five** or more hours).
3. Specific workshop area criteria. Workshop area should be in close proximity to the helipad. A workshop area is defined as an area where a desk, shelves, workbench, storage, and telephone are available.
 - a. Workshop area should be climate-controlled, heated and cooled, to avoid adverse effects of temperature extremes.
 - b. Appropriate ventilation will be installed to clear the facility of hazardous fumes (such as those from fuels, solvents, oils, adhesives, cleaners) common to the aviation environment.
 - c. Workshop area should be well lit with the appropriate number of electrical outlets.
 - d. Floodlights should be available on the helipad – fixed and/or portable. Luminescence level will be equal to the modern office environment.
 - e. Hand cleaners, disinfectants and eye wash bottles are to be available.
 - f. Tools are locked in a secured area when not in use.
 - g. There is a policy to address the control of foreign object debris (FOD).
 - h. There is a tracking system for the mechanic to account for tools and parts after performing maintenance.

4. Storage of equipment, parts, and tools is orderly and clear of fire hazards and in compliance with **national health and safety standards** ie. OSHA and Environmental Protection Agency (EPA) regulations.
5. There is a system to periodically track timed parts and expiration dates on shelf items.
 - a. All parts are properly tagged and environmentally protected.
 - Parts are wrapped or boxed in a manner that prevents damage or contamination.
 - Open ends of fabricated and bulk lines and hoses are capped or covered.
 - Serviceable parts are kept in a separate area from unserviceable parts.
 - b. Parts received are inspected to ensure an approved vendor provided them and that the required certification documentation is provided.
6. Airworthiness directives and service bulletins are coordinated to ensure they are accomplished on time.
7. There is a method to track all deferred maintenance items and coordinate all requirements to support closure.
8. There is a method to track tool calibration status.
 - a. Tools requiring calibration have documentation or tags on the tools that list the last calibration date and the next due date.
 - b. If employee-owned tools are permitted on the premises, there is a system to ensure that these tools are currently calibrated.

05.08.04 Maintenance Distractions — A policy should be written and implemented to reduce the likelihood of interruptions and distractions to the mechanic, such as:

1. The mechanic's phone should have voice mail or messaging.
2. Aircraft tours, public relations events, janitorial services, etc., should be postponed or canceled if involving the aircraft while maintenance is being performed.
3. Mechanic's work site (hangar-helipad) should not be used as a gathering place/social area by the flight team while maintenance is being performed.
4. All calls and inquiries regarding the aircraft status will be screened.

05.09.00 HELIPAD

05.09.01 Primary **and** receiving hospital helipad(s) must :

1. Be marked (with a painted H or similar landing designation)
2. Be identified by a strobelight or heliport beacon. A beacon may not be necessary when the location of the hospital can be readily determined by the lights(s) on a prominent building or landmark near the helipad.
3. Have perimeter lighting for night operations.
4. Have a device to identify wind direction and velocity (i.e., windsock). The wind indicator should be located in an illuminated area or lighted for night operations.
5. Have at least one clear final approach and takeoff area (FATO) according to the FAA Advisory Circular entitled Heliport Design Advisory Circular, AC 150/5390-2A which also includes:

- a. Takeoff and landing area length and width, or diameter, should be 1.5 times the overall length of the helicopters that utilize the helipad.
 - b. Surface of the helipad should be clear of objects, including parked helicopters.
 - c. A parking area should be provided if more than one helicopter at a time is to be accommodated.
6. Have at least two approach and takeoff paths, oriented to be 90-180degrees apart.
 7. Have adequate fire retardant chemicals readily available.
 8. Have documented, ongoing safety programs for those personnel responsible for loading and unloading patients or working around the helicopter on the helipad.
 9. Have evidence of adequate security— a minimum of one person to prevent bystanders from approaching the helicopter as it lands or lifts off, or perimeter security such as fencing, roof top, etc. A means must exist to monitor the primary helipad if accessible to the public, i.e., through direct visual monitoring or closed circuit TV.
 10. There should be a policy to address more than one running aircraft at any one time and a policy to address permission to land or take off from the helipad.

a. Communications policies will include:

- Procedures that coordinate arrivals and departures with referring and receiving hospital helipads – specific contact arrangements are pre-arranged for each frequently used location.
- Procedures that coordinate arrivals and departures from hospital helipads with other air medical services in the region.
- Staging if more than one aircraft is expected.
- Air to air communications.
- Hosting common frequencies.
- Procedures that require communications specialists to ask if more than one aircraft is incoming to the same hospital helipad or scene.
- Written agreements with local, regional or state agencies that incoming aircraft will announce in the blind on a common frequency when operating into a hospital and scenes where no common frequency has been pre-established. At 10 minutes from ETA, any inbound aircraft should communicate on 123.025 or commonly agreed upon frequency.

b. Crew Coordination:

- Strict enforcement of sterile cockpit.
- One medical crewmember taking active part in watching for obstructions during the critical stages of flight.
- Before departing from a scene or a sending institution, the medical crew and the pilot should discuss any alternative hospitals that they might need to

divert to should the patient's condition change. The pilot and medical crew are encouraged to pre-program any radios or navigation equipment for this alternative destination to minimize the workload required to effect this change, should the need arise as coordinated with the communications center.

c. It is strongly encouraged that the program develops pre-determined landing sites for scene coordination with ground agencies where possible.

11. There is limited distance from the helipad to the hospital (positioned at the closest, safe location) in order to minimize the effects to the patient.

a. Patient monitoring should continue without interruption between the helipad and the hospital.

b. **The medical crew is continuously supplied and equipped so that emergent patient interventions** can be performed as needed between helipad and hospital.

12. Hearing protection is provided for and used by all personnel who assist with patient rapid loading/ unloading.

13. Evidence of a system to communicate changes (**construction, additions, obstructions, etc.**) to the helipad for users of the primary helipad(s) must be available and may include a pilot's memo book or a database in the communications center. A system to record acknowledgment must be in place.

05.09.02 Occasional or episodic use helipad. Helipads used occasionally (such as at referring or receiving hospitals):

1. Evidence of a system to communicate changes to the occasionally used helipads (at referring or receiving facilities, predesignated helistops, fueling pads, etc.) must be available to users of the helipads and may include a pilot's memo book or a database in the communications center.

2. Helipads used occasionally should be reviewed periodically or during normal operations for the following, and changes are noted in the database or in other means of communications to describe:

a. Obstructions and hazards.

b. Lighting for night operations.

c. Approach and departure obstacles and/or routes.

d. Special procedures or considerations, i.e. noise abatement.

e. Adequate security to prevent bystanders from approaching the helicopter as it lands and lifts off.

f. Communications requirements.

g. Adequate fire retardant chemicals are readily available which must include:

- A minimum of one portable fire extinguisher with a minimum range of 80-B:C.
(See *References in Appendix*)

05.09.03 Temporary scene landings should be:

1. Secured.

2. Lit at the perimeter with handheld floodlights, emergency vehicles or other lighting source to define the designated landing area at night.

3. Free of obstructions and ground debris.

4. Appropriate to the size of the helicopter.

05.10.00 FUEL SYSTEMS

05.10.01 A policy should require that the pilot or designee stay with the aircraft when refueling to verify fuel type and quantity received **during on-site and off-site refueling.**

05.10.02 On-site ~~and off-site~~ refueling.

1. **If a certificate holder maintains and operates its own fuel farm,** then there must be a written policy that clearly identifies who has responsibility for quality control checks on the fuel system.

- a. **Daily, monthly, quarterly and annual checks are required.**

- b. **Documentation is in compliance with national aviation regulations ie. FAA AC 150-5230-4A.**

- c. **If using a vendor's fuel farm, verify QA fuel quality compliance.**

2. There is a procedure to ensure the fuel is free of contaminants before dispensing into the aircraft.

3. Procedures clearly demonstrate safe practices and fire prevention considerations at the on-site refueling facility.

- a. At least one fire extinguisher is located no less than 75 feet from the fuel dispensing station.

- b. There is a minimum of one remote fuel shut-off device.

4. There is a policy regarding on-site handling and disposal of waste fuel, oil and any other hazardous materials.

5. The fuel system is approved by the Environmental Protection Agency (EPA).

SECTION 6. - FIXED WING STANDARDS

06.00.00 CERTIFICATE OF THE AIRCRAFT —Certificate holder must meet all Federal Aviation Regulations (FARs) or national/international regulations specific to the operations of the medical service in the country of residence, as applicable. This includes a FAR Part 135 or national aviation regulations. Certificate (public service medical transport agencies are included in this requirement) or a pertinent operating certificate if outside of the U.S., and Air Ambulance Operations Specifications specific to EMS operations.

06.01.00 ALL "PATIENT ~~TRANSPORT MISSION~~ FLIGHTS"* must be conducted under FAA Part 135 regulations for weather minimums and flight crew duty time limitations.

**Patient ~~transport mission~~ flight is defined as any flight segment conducted by rotor or fixed wing equipment that is necessary for transporting patients and the medical teams required to care for such patients. Flight segments included in this definition are: flights for refueling and repositioning for a specific patient transport (including organ donor transports); picking up and returning medical teams to an assigned base; the actual flight segment involving patient movement; and any time medical teams are on board.*

06.02.00 AIRCRAFT

06.02.01 The aircraft should be a twin-engine or turbine single engine aircraft appropriate to the mission statement and scope of care of the medical service **and listed on the air carriers Operations Specifications.**

06.02.02 Pressurized aircraft **with air conditioning** are strongly preferred for medical transports. A physician familiar with altitude physiology should be consulted or written policies address altitude limits for specific disease processes of the patient to be transported in an unpressurized cabin.

06.02.03 Evidence of adequate security **at the base of operations**—A means must exist to monitor the aircraft (i.e., through direct visual monitoring or closed circuit TV) or the aircraft must be in a secured location with locked perimeter fencing or hangar available.

06.03.00 WEATHER

06.03.01 VFR or IFR flight plans are filed or communications center does flight following with every takeoff through post-landing .

1. There is a system of obtaining pertinent weather information.

a. The pilot in command (PIC) is responsible for obtaining weather information according to policy, which should address at a minimum:

- Routine weather checks.
- Weather checks during marginal conditions.
- Weather trending.

2. Communication between pilots, medical personnel, and communication specialists regarding the most current and forecasted weather is part of a formal briefing.

06.03.02 There is a policy designed to discourage ‘shopping’ by first responders and other requesting agents that specifically addresses how the program interfaces with other air medical services in the same coverage area to alert them of a weather turn-down.

06.03.03 It is recognized that programs in a common geographic area may experience differing weather conditions and that programs may have differing capabilities. However, programs that turn down a request within 250 miles radius of the base due to weather should:

1. Ask the requesting agent if another flight program had turned down the request.
2. Notify the requesting agent that the programs in their coverage area share weather information and turn-downs for safety reasons.
3. Notify other programs within their coverage area of the turn-down as soon as possible.
4. Provide the on-duty pilot with contact information from other programs for questions about the weather concerns and details (fog, precipitation, wind, etc.).
5. Inform the on-duty pilot immediately if notified of a weather turn-down by another program.
6. Have written evidence of tracking the requests turned down for weather and of participation in a regional notification systems as described in 1. through 5. above.

06.03.04. The certificate holder will maintain an FAA approved training program in accordance with 14CFR Part 135, subpart H. The training program should contain a procedure for evaluating previous experience and training

to determine what specific training a new flight crewmember will require to satisfactorily meet all required training and checking standards. The certificate holder will also have a process in place to properly track experience levels of new Captains that must comply with the higher weather minimums as required under 14CFR Part 135.225 (e).

06.04.00 PILOT PERSONNEL

06.04.01 Staffing – The pilot must be readily available within a defined call-up time to ensure expeditious and timely response. There must be a written policy describing the availability of pilots.

1. Scheduling practices reflect consideration for minimizing duty-time fatigue, length of shift, number of shifts per week and day-to-night rotation.
 - a. The certificate holder has a written policy regarding pilots on call with the use of remote paging devices, **cell phones or other electronic communication device**. The policy indicates how the use of pagers impacts duty-time limitations.

Examples of Evidence to Exceed Compliance:

Two-pilot operations are required even when the aircraft is legally flown with a single pilot.

2. Physical well-being is promoted by the employer wellness programs to include but not limited to balanced diet, weight control, and no smoking.
3. Operations facilities should include a quiet area for flight planning, training, and record-keeping.

06.04.02 Pilot determines that the aircraft is in airworthy condition.

1. Prior to the first flight of shift of duty, the pilot:
 - a. Verifies that maintenance is not due on the aircraft.
 - b. Performs a pre-flight inspection according to the manufacturer's checklist.
2. A walk-around inspection of the aircraft is performed prior to each takeoff.

06.04.03 The pilot-in-command qualifications.

1. Must possess 2000 airplane flight hours prior to assignment with a medical service with the following stipulations:
 - a. At least 1000 of those hours must be as PIC in an airplane.
 - b. At least 500 of those hours must be multi-engine airplane time as PIC. (Not required of single-engine turbine aircraft).
 - c. At least 100 of those hours must be night flight time as PIC.
2. PIC must be ATP rated; SIC is strongly recommended to be ATP rated and must complete a certificate holder's approved SIC training program.

3. In aircraft that require two pilots, both pilots must be type rated for that make and model, and both pilots must hold first class medical certificates if the certificate holder operates internationally.

Examples of Evidence to Exceed Compliance:

All PICs and SICs are ATP rated, or both pilots hold a PIC Type Rating for the aircraft being operated.

06.04.04 Pilot training requirements.

1. Initial training should, at a minimum, consist of the following and be verified by written criteria, outlines or curriculum. Use of FAA approved training devices and simulators along with mission specific scenario based training should be encouraged at initial and recurrent training cycles.

Examples of Evidence to Exceed Compliance:

All pilots undergo initial and annual scenario-based simulator training.

- a. Terrain and weather considerations specific to the program's geographic area.
- b. Orientation to the hospital or health care system associated with the medical service.
- c. Orientation to infection control, medical systems installed on the aircraft and patient loading and unloading procedures.
- d. Air Medical Resource Management (AMRM), consistent with **national aviation regulations** ie. FAA Advisory Circular No. 120-51E, 2004 and FAA AC 00-64.

Specific content of AMRM training and organization of topics should reflect an organization's unique culture and specific needs, such that curriculum topics may include, but not be limited to:

- Communications Processes and Decision Behavior
 - Inquiry
 - Inquiry advocacy assertion
 - Crew self-critique re: decisions and actions
 - Conflict resolution
 - Communications and decision making
- Team Building and Maintenance
 - Leadership/followership/concern for tasks
 - Interpersonal relationships/group climate
- Workload Management and Situation Awareness
 - Preparation/planning/vigilance
 - Workload distribution/distraction avoidance
 - Individual factors/stress reduction

e. Training in infection control, medical systems and installations on the aircraft, patient loading and unloading procedures.

f. Minimum requirements for specific training in aircraft type:

- 25 hours in specific make and model of aircraft before flying as PIC on patient missions or completion of a commercially established training program for the specific make and model aircraft and the successful completion of the check ride.

2. Annual recurrent training to minimally include the following and verified by written criteria, outlines or curriculum.

- a. Part 135 instrument proficiency check as required by **national aviation regulations ie.** FAR 135.297 for operations that conduct IFR flights.
- b. Annual review of infection control, medical systems installed on the aircraft, and patient loading and unloading procedures.
- c. Air Medical Resource Management (AMRM), consistent with FAA Advisory Circular No. 120- 51E, 2004 and FAA AC 00-64.
- d. Specific content of AMRM training and organization of topics should reflect an organization's unique culture and specific needs, such that curriculum topics may include, but not be limited to:
 - Communications Processes and Decision Behavior
 - Inquiry
 - Inquiry advocacy assertion
 - Crew self-critique re: decisions and actions
 - Conflict resolution
 - Communications and decision making
 - Team Building and Maintenance
 - Leadership/followership/concern for tasks
 - Interpersonal relationships/group climate
 - Workload Management and Situation Awareness
 - Preparation/planning/vigilance
 - Workload distribution/distraction avoidance
 - Individual factors/stress reduction

06.05.00 POLICIES

06.05.01 There is an established written policy to ensure that the pilot is notified of any add-on equipment for weight and balance considerations.

06.05.02 There is a written policy and outline of passenger safety briefings **in accordance with 14CFR Part 135.117.**

06.06.00 MAINTENANCE

06.06.01 The mechanic primarily assigned to a specific aircraft must possess a minimum of two years of airplane experience as a certified airframe and power plant mechanic prior to assignment with a medical service. **or in the case of a repair station the Maintenance Repair Organization (MRO) will hold a FAA issued certificate under 14CFR Part 145, and hold the ratings and/or limitations within its Operations Specifications for the make/model for which it is performing scheduled maintenance upon.**

06.06.02 The mechanic(s) must be appropriately qualified to maintain the aircraft operated by the medical service and who possesses a minimum of two years of experience as a certified airframe and powerplant mechanic prior to assignment with the medical service.

1. Any mechanic performing scheduled maintenance to a specific aircraft must be factory schooled or equivalent in an approved program on the type-specific airframe, the powerplant and all related systems.

~~1. The mechanic primarily assigned to a specific aircraft must be factory schooled or equivalent in an approved program on the type specific airframe, the powerplant and all related systems. The primarily assigned mechanic provides direct (on site during maintenance) supervision to other mechanics assisting with maintenance who may not have this level of experience or training.~~

2. All mechanics should receive formal training on human factors and maintenance error reduction.

(See References in Appendix)

3. A policy is written that grants the mechanic permission (without fear of reprisal) to decline from performing any maintenance critical to flight safety (that he has not been appropriately trained for), until an appropriately trained mechanic is available to directly supervise or assist.

4. There is an annual review of infection control, medical systems and installations on the aircraft, patient loading and unloading procedures for all mechanics.

5. There will be at least one technician **or MRO** available for each service with formal training on the aircraft electrical system and formal training on the autopilot system (if autopilot equipped).

06.06.03 Training should prepare the mechanic for inspection of the installation as well as the removal and reinstallation of special medical equipment.

06.06.04 There is supplemental training on service and maintenance of medical oxygen systems and a policy as to who maintains responsibility for refilling the medical oxygen system.

06.06.05. The certificate holder will have a system in place to track all scheduled inspections as required by its FAA approved maintenance program. This system will include all Air worthiness Directives (AD) and applicable Instructions for Continued Airworthiness (ICA).

06.07.00 STAFFING

06.07.01 A single mechanic on duty or on call 24 hours a day should be relieved from duty for a period of at least 24 hours during any seven consecutive days, or the equivalent thereof, within any one calendar month. In addition:

1. It is strongly encouraged that mechanics should not be permitted to work more than 14 continuous hours.

2. Following extended maintenance, such as 12–14 continuous hours, it is strongly recommended that a mechanic should be scheduled for eight hours of uninterrupted rest.

06.07.02 For more than one aircraft, staffing should be appropriate to the hours the aircraft are in service, the complexity of the aircraft, and the number of bases necessitating travel time. Backup personnel should be provided to the mechanic during periods of extensive scheduled or unscheduled maintenance or inspection.

06.08.00 MAINTENANCE FACILITIES

06.08.01 There must be a mechanism/procedure for alerting flight and medical personnel when the aircraft is not airworthy.

06.08.02 The maintenance facilities are large enough to accommodate the aircraft, adequately lighted and properly equipped for required maintenance.

06.08.03 Specific workshop area criteria.

1. Workshop area should be in close proximity to the hangar. A workshop area is defined as an area where a desk, shelves, workbench, storage and telephone are available.

2. Workshop area should be climate controlled (heated and cooled) to avoid adverse effects of temperature extremes.
3. There is appropriate ventilation to clear the facility of hazardous fumes (such as fuels, solvents, oils, adhesives, cleaners) common to the aviation environment.
4. Work area should be well lit with the appropriate number of electrical outlets.
5. Floodlights should be available in the hangar or on the tarmac, fixed and/or portable. Luminescence level will be equal to the modern office environment.
6. Hand cleaners, disinfectants and eye wash bottles must be available.
7. Tools are locked in a secured area when not in use.
 - a. There is a policy to address the control of foreign object debris (FOD).
 - b. There is a tracking system for the mechanic to account for all of the tools and parts, after performing maintenance.

06.08.04 Storage of equipment, parts, and tools is orderly and clear of fire hazards and in compliance with OSHA and EPA regulations.

06.08.05 There is a system to periodically track timed parts and expiration dates on shelf items.

1. All parts are properly tagged and environmentally protected.
 - a. Parts are wrapped or boxed in a manner that prevents damage or contamination.
 - b. Open ends of fabricated and bulk lines and hoses are capped or covered.
 - c. Serviceable parts are kept in a separate area from unserviceable parts.
2. Parts received are inspected to ensure an approved vendor provided them and that the required certification documentation is provided.

06.08.07 **If the ~~air carrier~~ certificate holder has been issued Operations Specification D095 (Minimum Equipment Lists), then there must be a method to track all deferred maintenance items and coordinate all requirements to support closure.**

06.08.08 There is a method to track tool calibration status.

1. Tools requiring calibration have documentation or tags on the tools that list the last calibration date and the next due date.
2. If employee-owned tools are permitted on the premises, there is a system to ensure that these tools are currently calibrated.

06.09.00 MAINTENANCE DISTRACTIONS—Policy should be written and implemented to reduce the likelihood of interruptions and distractions to the mechanic, such as:

06.09.01 The mechanic's phone should have voice mail or messaging.

06.09.02 Aircraft tours, public relations events, janitorial services, etc., should be postponed, if they involve the aircraft while maintenance is being performed.

06.09.03 Mechanic's work site (hangar) should not be used as a gathering place/social area by the flight team while maintenance is being performed.

06.09.04 All calls and inquiries regarding the aircraft status will be screened.

06.10.00 FUEL SYSTEM - If a certificate holder maintains and operates its own fuel farm, then there must be a written policy that clearly identifies who has responsibility for quality control checks on the fuel system.

06.10.01 There is a procedure to ensure the fuel is free of contaminants before dispensing into the aircraft.

06.10.02 A policy clearly identifies who has responsibility for quality control checks on the service's fuel system.

a. Daily, monthly, quarterly and annual checks are required.

b. Documentation is in compliance with or national equivalent i.e. FAA AC 150-5230-4A.

c. If using a vendor's fuel farm, verify QA fuel quality compliance.

06.10.03 Procedures clearly demonstrate safe practices and fire prevention considerations.

06.10.04 A policy requires that the pilot or designee stay with the aircraft when refueling to verify fuel type and quantity dispensed **when refueling at any location.**

SECTION 7. – GROUND INTERFACILITY STANDARDS

07.00.00 AMBULANCES

07.01.00 SPECIFICATIONS Vehicles must meet current KKK 1822 guidelines or state licensure requirements in place at the time the ambulance was built.

07.01.01 Licensure—The ambulance will be licensed in accordance with the applicable state and/or local/national laws.

Examples of Evidence to Meet Compliance

Licenses to operate each ambulance are available and current.

07.01.02 The ambulance must have adequate interior lighting equipment to ensure complete observation of the patient and monitoring equipment used on the patient.

07.01.03 The ambulance must have the capability of shielding the cab from light in the passenger compartment during nighttime use.

~~07.01.04 The ambulance must be equipped with a heater/air conditioner system capable of maintaining comfortable interior temperatures during all temperature extremes of the coverage area.~~

See 07.01.04 Inside of the ambulance must be capable of maintaining temperature ranges to prevent adverse effects on the patient and crew (between 68 degrees F and 78 degrees F- see KKK reference) and there is a procedure to monitor inside cabin temperatures.

07.01.05 The ambulance must have a fuel capacity to provide no less than a 175-mile range.

07.01.06 The ambulance must have ground clearance of at least six inches at gross ambulance weight.

07.01.07 The ambulance must be able to fully perform at ambient temperatures minus 30 degrees to 122 degrees F.

07.01.08 The ambulance must be marked clearly to show the name of the service in letters not less than three inches high, and to allow identification of the service from the sides and rear of the ambulance.

07.01.09 Lights and sirens:

1. The ambulance must be equipped with a siren capable of emitting sound that is audible under normal conditions from a distance of not less than 500 feet.
2. The ambulance must have at least one light capable of displaying red light (with a 360 degree capacity) or strobe lights that are visible under normal atmospheric conditions from a distance of 500 feet from the front of the ambulance.

07.01.10 The ambulance is equipped with road hazard equipment to be used in the event of a breakdown.

Supporting Criteria

1. Road hazard equipment should minimally include:
 - a. Flashlight.
 - b. Road marking device – cones, flares or triangles, for example.
 - c. Tools, wrench, screwdriver, hammer.
 - d. Leather, heavy-duty gloves.
 - e. Reflective vests.
 - f. Hatchet or band saw (in case of a fallen tree).
 - g. Equipment for dealing with snow as appropriate to the environment.

07.02.00 COMMUNICATIONS

07.02.01 There is a means of communication other than a cell phone between:

1. The driver position and patient compartment.
2. The ambulance and medical control.
3. The ambulance and public safety.

07.02.02 A policy prohibits cellular phone use while the motor is running unless there is no other means to transmit an urgent communication. Texting is strictly prohibited

07.03.00 QUALIFICATION OF DRIVERS—All persons who drive the ambulance should be at a minimum certified as an Emergency Medical Technician Basic (EMT-B) or have equivalent training.

07.03.02 Drivers must have a minimum of **two** years experience as a licensed driver or operator.

07.03.03 Drivers are required to complete defensive driving training program that is developed by the provider or outside agency. The training must include an Emergency Vehicle Operations Course (EVOC) or equivalent, which consists of at least **four** hours of reviewed ambulance driving under emergency conditions.

07.03.04 This training program should be repeated for each driver at least every **four** years.

07.04.00 AMBULANCE MAINTENANCE

07.04.01 Each ambulance must be maintained in full operating condition and in good repair, and documentation of maintenance must be kept on file. In addition, there should be a regular documented preventive maintenance program in accordance with the requirements of the manufacturer and other regulatory agencies.

1. There are documented daily checks of the vehicle for damages and equipment failure.

07.04.02 There should be no evidence of damage penetrating the body of the ambulance or holes that may allow exhaust gases to enter the patient compartment.

07.04.03 The interior of the ambulance, including all storage areas, must be kept clean in compliance with OSHA (or equivalent) standards, that is free of dirt, grease and other biohazardous or noxious matter.

07.04.04 The ambulance must be cleaned after each patient transport as appropriate. All interior surfaces in the ambulance and medical equipment surfaces that came in contact with the patient must be immediately cleaned and disinfected or disposed of in a secure biohazard container.

07.05.00 MECHANIC - The mechanic should have experience as a certified mechanic in a shop environment, or the maintenance should be done at a certified shop specific for the make and model of the chassis.

07.06.00 POLICIES

07.06.01 There is a written policy that addresses speed limitations and all aspects of traffic law compliance that pertain to ambulance operations.

07.06.02 There is a written policy that describes the appropriate use of lights and sirens. Red lights and sirens should be used only when time is critical to the patient's outcome. When responding with lights and sirens, the ambulance should come to a complete stop at intersections as appropriate.

07.06.03 There is a written policy that addresses a procedure to follow when the ground ambulance comes upon an accident scene. Policy must be consistent with state regulations.

07.06.04 There is a written policy that outlines a procedure to follow when the ground ambulance is involved in an accident with damage and/or injuries.

07.06.05 There is a written policy outlining the procedure for a mandatory drug test of the driver after any accident.

07.06.06 There is a written policy outlining the procedure to follow when the ambulance breaks down.

07.06.07 There is a written policy dealing with safety aspects of driving:

1. Driver duty and rest time.
2. Inclement weather and responsibility for aborting the transport if there is a safety concern.

3. Driving records (speeding and other traffic violations) are reviewed by management minimally on an annual basis.

07.06.08 There must be a written policy addressing weather/environmental conditions that prohibit transport such as zero/zero visibility and highway patrol road closures.

REFERENCES for Climate Control (please note a full list of references for all the accreditation standards will be listed in the final document).

http://seniorhealth.about.com/od/heartdiseas1/a/humidity_heart.htm references to 70 degrees and 70% humidity advisory

<http://www.springerlink.com/content/t6n4034358463621/>

<http://linkinghub.elsevier.com/retrieve/pii/S0167527305002950>

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1025097/pdf/brheartj00015-0017.pdf> full article with list of references; focuses on cold

<http://cardiovascres.oxfordjournals.org/content/28/7/1014.abstract> temperature's effect on MI size

<http://www.springerlink.com/content/n7j2g1w72242366v/> increased mortality from cold with MIs

<http://heart.bmj.com/content/95/21/1760> a study of studies - increased risk of MI from both hot and cold weather; this is an abstract from 2009 – that states, “the effects of ambient temperature on overall mortality are well documented”.

ERGONOMICS, 2002, VOL. 45, NO. 10, 682 ± 698 Effects of hot and cold temperature exposure on performance: a meta-analytic review

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“CRITICAL CARE Effect of excessive environmental heat on core temperature

in critically ill patients. An observational study during the 2003 European heat wave”

F. Stephan1*, S. Ghiglione1, F. Decailliot1, L. Yakhou1, P. Duvaldestin1 and P. Legrand2

KKK-A-1822f Ambulance Purchasing Standards

3.13.1 Environmental Systems

"..... will be capable of maintaining a patient compartment temperature of 68 degrees F. to 78 degrees F. while patients are in the patient compartment. ..."

State EMS Agencies with Temperature Requirements for Ambulances:

CT (“ability to achieve and maintain an average patient compartment temperature of 65 – 70 degrees regardless of weather conditions.”)

NJ (i. 68 – 72 degrees F when the outside temperature is between 75 and 85 degrees F and

ii. At least 13 degrees F below the outside temperature when the outside temperature is over 85 degrees F).

PA – all air ambulances. The air ambulance must have: “Climate controls for maintaining an ambient cabin temperature of between 65-85 degrees F during flight.”

KY – “(b) The air conditioning system shall maintain a temperature of not more than 85 degrees F in the driver and patient compartments “

MD – 55. “Climate Control System – The rear air conditioner should be blowing air temperature of at least 65 degrees or lower...”

FEMA References:

(<http://training.fema.gov/IS/crslis.asp>) on Incident Command: IS-100.a or IS-100.HC - Introduction to Incident Command, IS-200.a - ICS for Single Resource and Initial Action Incidents and IS-700.a National Incident Management System, An Introduction.

Just Culture:

See www.justculture.org

Threat and Error Management (TEM) - History by Cpt Bruce Tesmer

Dr. Bob Helmreich & Cpt Bruce Tesmer received the Aviation Week and Space Technology Laurel Award for Commercial Aviation Safety in 2001 for the development of the Line Operations Safety Audit (LOSA) program. Dr. James Klinect, then a PhD student, was the lead researcher on LOSA and put forward the first strawman of the TEM taxonomy. That structure of the data showed how spontaneous human errors (James Reason model of slips, lapses, and mistakes) are ubiquitous. The data also showed that hazards outside the control of the crew's influence such as weather, ATC errors and difficult clearances, aircraft and equipment failures, birds etc. all contribute to increasing the difficulty of the system's environment. The next revelation was quite basic; the more difficult the operating environment the more likely the crew would error in the management of one or more hazards that had presented themselves to the crew.

Hazards that were known to exist by the company before the crew began executing the ops plan (their flight), should have been risk assessed and if found to be too great a risk, they should have been risk reduced by adding tasks or decision points for the crew to use to manage those risks if they should be realized once the flight had begun. Risk is not usually a concern of the flight crew because the likelihood of an occurrence doesn't have context. The crew needs to worry and manage only the hazards that actually happen. For example: the pilots on Flight 1549 didn't need to worry or manage the risk of both engines losing power on any of their previous flights since the engines didn't fail. However, while the risk of two engines failing is infinitesimally small, on that flight, the hazard was realized and the crew was forced to manage that hazard as a THREAT.

In 1549's case, the situation rapidly became an Undesired State since the emergency procedure for engine re-start failed and nothing more could be done to bring engine power back to the aircraft. Identifying the threat, verbalizing the engine re-start procedure, verifying no restart and monitoring the powerless state, all provided for building the CRM attributes of communication, coordination/teamwork, situational awareness that led to the decision to control the aircraft for a Hudson River ditching as their best option. Was it a miracle, blind luck, excellent training, great CRM? It was all of those. It also included using all of the TEM countermeasures that led to a good decision.

You don't need to experience an accident like 1549 or any other, to learn how to use TEM as a frontline employee (pilots in aviation or frontline care givers in medicine). If you have an accident, investigation and analysis of that event in terms of the TEM taxonomy will provide insight into the threats, errors, undesired states that were involved and how they were managed. It will point to hazards that were

realized as threats and how difficult the environment was during the precursor stage of the event. It will show how the "tools" (briefings, callouts, limitations/bottom-lines, checklists, sterile cockpit and SOP) used to marry task completion of the ops plan tasks to the humans, affected the outcome of the event. However, before the next accident, data can be collected that identifies the accident precursors so that hazards that are new or have changed can be re-risk assessed and reduced. Company philosophies, policies, procedures and "tools" can be changed to help reduce the difficulty of the system environment. These are things the organization can do as accident interventions, whether they involve machine type fixes like installing a black box to show other air traffic (TCAS), display terrain and obstacles (TAWS) or detect a micro burst (windshear warning).

On the human side of accident interventions, the data can be used by frontline employees to better investigate their current and future status regarding threats and how to deal with them before they find the environment has become so difficult that mismanaging a single threat could be the precursor to an accident. The safety data collection programs include normal operations monitoring (LOSA), automatic status reporting from the machine being used (FOQA) and/or frontline employee reporting (ASAP/ASRS/Close call).

From the data and with training, the organization and its frontline employees can proactively respond to precursor data and not wait for the next accident to take action.

