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Proposed Change to **AC 27-1, AC 27 MG 6**; Title: EMERGENCY MEDICAL SERVICE (EMS) SYSTEMS INSTALLATIONS INCLUDING: INTERIOR ARRANGEMENTS, EQUIPMENT, HELICOPTER TERRAIN AWARENESS AND WARNING SYSTEM (HTAWS), RADIO ALTIMETER, NIGHT VISION IMAGING SYSTEMS (NVIS), AND FLIGHT DATA MONITORING SYSTEM.

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AAMS/HAI/AMOA	General	We believe the opportunity for industry discussion with the FAA to consider the implications and unintended consequences should reflect the significant nature of the proposed changes.	Request the FAA delay the release of this draft AC for comment until after the Final Rule is published.	Not adopted; while this guidance may be used once the Final Rule is published, these types of systems are currently installed on various helicopters for various operational usages, including emergency medical operations. The current AC 27-1B, MG 17 discusses these type of systems installed on helicopters for safety enhancing systems that are not necessarily required for helicopter operations. Discussing these safety enhancing systems in this guidance is appropriate based on these systems being used in helicopter emergency medical operations to provide acceptable guidance for safely installing and using these safety enhancing systems without causing additional safety concerns in an already complex configuration. Upon issuance of the Final Rule, the AC will be reviewed before its issuance to ensure that it is compatible with the Final Rule.
AAMS/HAI/AMOA	General	Several of the items discussed in this AC, including Helicopter Terrain Awareness and Warning Systems (HTAWS), Radio Altimeter (RAD ALT), and the operation of HEMS under a Part 135 subpart L certificate, are all a subject of a proposed regulation that has not been adopted. Section 135.605 is not a current regulation, and the industry is unclear as to	The design and functionality of these devices should be a part of that rule, not this AC.	Not adopted; as discussed in the previous comment, the FAA has current guidance (AC 27-1B, MG 17) and this information is also appropriate for this MG 6 guidance as this type of safety enhancing systems is currently being installed and used for helicopter emergency medical configurations. The purpose of MG 6 is to address helicopters configured for emergency medical support. Upon issuance of the Final Rule, the AC will be reviewed before its issuance to ensure that

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		why these items are included in this AC as requirements preceding the regulation requiring them. Flight Data Monitoring Systems (FDM) as described in this AC, were not even a part of the proposed rule; rather the FAA indicated it was "considering." without actually proposing, requiring Light Aircraft Recording Systems (LARS). FDM as described by this AC was not a part of the NPRM. Further, we do not understand why the requirement for those items must be addressed in both the rule (assuming they are addressed in the pending final rule) and in this AC.		it is compatible with the Final Rule.
AAMS/HAI/AMOA	General	The air medical industry has not had a chance to comment on the specifications of these devices [FMD] as they may be required by the pending final regulation; this again amounts to a regulation by advisory circular. The NPRM states: "The FAA is considering requiring certificate holders conducting helicopter air ambulance operations to install a light-weight	The industry requests the opportunity to comment on a proposed rule to require these devices in the context of their capabilities, not proposed guidance.	Noted; public comments are part of the FAA rulemaking process. This guidance will only be adopted if the final rule is adopted, and industry has already been given the opportunity to comment on the rule. Upon issuance of the Final Rule, the AC will be reviewed before its issuance to ensure that it is compatible with the Final Rule.

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		aircraft recording system (LARS) in their helicopters."		
NORTH Flight Data Systems	General	Please know that we are heavily involved in this technology and have approximately 100 systems installed in HEMS helicopters. We already have our system STC'd on the EC135 and EC155 series helicopters and have both EC145 and B407 STC projects underway. We also have HEMS customers with EC130, AS350 and B206 aircraft committed to our STC efforts pending accommodation by the ACO. The suggestions we present are the result of what leaders in the HEMS industry are already doing now and clearly fall in line with the what we see as the intent of the proposed AC.		Noted; no response required. Commenter provided remarks without any recommendation or suggested change.
NORTH Flight Data Systems	General	The limiting factor with regard to the equipment installation is the pace of the STC process on the part of the FAA ACO's. Hardware has been developed by a number of avionics manufacturers and cooperation from engine and airframe OEM's has been steadily increasing. Access to, and use of, aircraft for certification has been generously provided by numerous	The FAA must provide the needed human resources to allow the STC process to move faster. We truly believe that market forces will achieve substantially better results in significantly less time if the FAA will support the STC efforts.	Noted; one of the reasons for developing this guidance material is to improve certification standardization of HEMS related equipment which in turn should improve the timeliness of these certifications.

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		certificate holders.		
AAMS/HAI/AMOA	Pg MG 6-1, para. a.(1)	"No Hazard Approval": The term describes a process that is not currently found in the FARs or, to our knowledge, in any other guidance material. If the FAA intends to create this approval process in this document, than the air medical industry requires significantly more information on the terms of this approval process, the frequency with which this process will occur, and the items that will be included in this approval. While we certainly agree that no items permanently installed should cause a foreseeable risk to aviation safety, the reference to a "no hazard approval" formalizes a process that can be and should be achieved by the operator prior to installing equipment or the pilot in command prior to loading equipment on board.	If the FAA is not prepared to further define and outline this process, then we request that the term be removed along with the reference to the approval of non-aviation related equipment in which the term was used.	Partially adopted; the term "No Hazard Approval" is found in our current AC guidance and is not something new to the certification process. All items installed on a rotorcraft must comply with the appropriate regulatory requirements. Title 14 CFR 27.601 states that the rotorcraft may have no design features or details that experience has shown to be hazardous or unreliable. Title 14 CFR 27.1309 states that the equipment, systems, and installations must perform its intended function and the equipment, systems of a multiengine or a single engine rotorcraft must be designed to minimize hazards to the rotorcraft in the event of a probable malfunction or failure. For these "No hazard approval" cases, the FAA finds that the installation of these will not create a hazard to the rotorcraft. This evaluation is done at the certification approval. However, to avoid any further confusion we have removed its use from the AC 27-1B MG 6.
AAMS/HAI/AMOA	Pg MG 6-1, para. a.(1)(i); Pg MG 6-3, para. b.(2)(i)	**"Trained Attendant"**: Medical personnel on board air medical aircraft are there to perform a medical function; while they may assist in certain limited duties in relationship to the aircraft- such as	We request that the term be removed along with references to medical crewmember duties. Should the FAA desire medical personnel to assist in the evacuation of patients, then the FAA should require certificate holders to	Partially adopted; we changed to "attendants" on page MG-6-1, para a.(1)(i) and changed to "Attendant" page MG 6-3 in para. b.(2)(i),.although this is an existing paragraph in the current advisory guidance, which has been used by applicants for certification of

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	Pg MG 6-4, para. b.(2)(iii)	securing doors- they are not aviation crewmembers and are in no way licensed or otherwise regulated by the FAA. In many situations they are not employed by the certificate holder and do not perform a function related to the certificate holder's oversight of aviation or aviation safety. As passengers on board the aircraft, the certificate holder may instruct medical crewmembers on how to safely evacuate the aircraft in case of an emergency; this instruction is no different from instructing passengers on any other type of aircraft the proper way to safely evacuate. Despite this, the FAA repeatedly attempts to use their presence on their aircraft as an opportunity to perform certain tasks related to aviation. The air medical industry strongly objects to the continued attempts by the FAA to assign medical personnel an aviation related duty. Further, the term "trained attendant" does not exist in the FARs, and should not be used to describe medical personnel.	brief medical personnel on how to assist patients in the event of an aircraft evacuation rather than require that training of the medical personnel themselves.	EMS approvals. Not adopted; page MG 6-4, para b.(2)(iii) is referring to a case in which a trained attendant may be required by 14 CFR 135.107. This is existing guidance with only editorial changes or to add clarity to the guidance.

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AAMS/HAI/AMOA	Pg MG 6-2, para. a.(2)(iv)	**"Life Support and Complex Medical Equipment" and "Configuration"**: The industry is concerned that the FAA has not adequately defined what is meant by these terms, and what type of equipment is included in these references. What must be addressed is the hazard this equipment may pose to aviation; topics such as whether this equipment is appropriately constrained or structured should be addressed using very specific language. However, the actual medical equipment should not in any way be certified by the FAA; the equipment is far outside of the FAA's expertise to evaluate, and the use of the equipment is constantly changing. The way the medical equipment is used is far too variable to be considered for certification. A 400 lb patient will have different medical needs than a 100 lb adult patient. A fracture patient is different than a cardiac patient. The equipment needs to be appropriately mounted and positioned in the aircraft as to not	If these terms are meant to include the support components of medical equipment (i.e. the components that are actually connected to the aircraft on or in which medical or other non-aviation equipment may be stored) then that must be made clear. If these terms are meant to include the various medical items themselves, then we strongly object to their inclusion, as these items are not related to aviation and the safe operation of the aircraft. Issues such as the use, function, calibration and capability of the medical equipment should not be included in the airworthiness standards. The language in the AC should make this clear.	Not adopted; this is the same as the existing guidance in AC 27-1B MG 6. The installation of any and all items installed in a helicopter must be FAA approved. This includes all equipment, medical or otherwise, that is installed in the helicopter. This is to ensure that hazards resulting from the installation of this equipment are adequately addressed. Not adopted; if installed in the helicopter, the installation of the items requires approval. This would include showing that the items perform their intended function and that there is no interference or hazard to the operation of the helicopter, including no hazard or safety concerns for helicopter occupants. Not adopted; if this equipment is installed in the helicopter, its installation must be approved. The proposed AC is the same as the current AC with some editorial and clarification changes.

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		create a hazard.		
AAMS/HAI/AMOA	Pg MG 6-3, para. b.(2)(i) Pg MG 6-4, para. b.(2)(iii)	**"Rapid Evacuation"**: This term is again not found in the FARs or related guidance material. Even the term "evacuation" as it is used in this AC is not properly defined in the context in which it is used. This leaves significant room for interpretation that will lead to variable enforcement across the air medical industry. The FAA must provide a very clear and concise definition to ensure that the guidance is properly understood by both the industry and FAA personnel; otherwise the guidance creates more ambiguity than it relieves.	We request that the FAA provide a more thorough discussion of what is required for approval; as written, the AC unacceptably leaves the approval up to the discretion of the inspector with literally no guidance for what constitutes approval beyond the ability to evacuate (or rapidly evacuate, if there is an intended difference).	Not adopted; the term evacuation is used extensively in the regulatory requirements. The word "rapid" is self-explanatory and the term "rapid evacuation" is currently in AC 27-1B MG 6. The paragraphs referenced in the comment are the same as is currently in the AC27-1B MG 6. Minor editorial and changes for clarity are the only changes from the current AC 27-1B MG 6.
AAMS/HAI/AMOA	Pg MG 6-3, para. b.(2)(i) Pg MG 6-3, para. b.(2)(ii)	**"Simple and Obvious"**: This term is used to describe the labeling of "the operation or use of devices for locking the position swivel seats and for the rapid installation and removal of litters (isolettes, etc.)". The AC does not describe what "simple and obvious" entails, and, like other terms, leaves that definition to the discretion of the inspector. This type of language is far too ambiguous and causes the need for further guidance.	We request that the language be removed as labeling this equipment is unnecessary; the operator provides medical personnel with the information needed to operate this equipment, similar to the briefing of passengers on the use of seats and safety belts prior to commercial airline flights.	Not adopted; this is the same as the current AC 27-1B MG 6 guidance. The regulations require certain placards and instructions for certain installations. While passenger briefings may be required in some cases, there have been cases during an emergency evacuation, where occupants could not evacuate properly due to not being able to operate emergency exits, emergency equipment, and various other life saving devices. EMS operations are unique in that there may be occupants that are incapable of evacuating due to other factors and are solely

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				dependent on other occupants, such as occupants in incubators or litters. For these reasons, labeling of certain equipment is necessary.
AAMS/HAI/AMOA	Pg MG 6-4, para. b.(3)(iii) & (iv)	This AC, though advisory in nature, appears to require significant aspects of the use of isolettes and other removable medical equipment not required by regulation. We believe that these requirements go far beyond the scope of guidance material and constitute regulation for the use of equipment that is not permanently installed in the aircraft. Many of these requirements are simply unattainable, such as flammability tests for isolette materials, and infant restraints in isolettes. This is medical equipment used in emergency situations to transport severely infirmed infants that is neither permanently installed in the aircraft nor a part of aviation equipment. The variability in the use of these types of medical equipment is extreme in isolette transports. There is no practical way to test all configurations. Unlike other complex electrical devices that are	The AC must clearly explain that this does not include carry-on items, even those that may be included in other types of equipment. Nor should it be a requirement of certified isolette installations; these are not aviation items.	Not adopted; the current AC 27-1B MG 6 addresses incubators (isolette installations) installed in the helicopter. All equipment installed in the helicopter must be approved for installation. The proposed AC includes medical carry–on items such as incubators, large medical equipment and other medical items that are not installed on the helicopter. This comment implies that both installed and carry-on, medical equipment does not need to be evaluated for safety since it is not an "aviation item." Anything installed on a helicopter must be approved for installation. Even carry-on equipment must be properly stowed and must be evaluated for hazards due to carriage of the carry-on equipment. In the case of large carry-on medical equipment such as incubators, it must be evaluated as to how it affects the safety of the helicopter and occupants, including the occupant in the incubator, while being carried on the helicopter. It must be properly restrained such that it does not come loose in an emergency landing. This would also include the restraint of the occupant in the incubator. Consequently, the means to stow or store the carry-on items must be evaluated for the

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		banned for in-flight use (cell phones), these medical devices are not transmitters, are not a convenience item, and are not optional equipment during those flights that require them. When these devices are in use, there is no viable alternative to their use. These devices are designed and used to maintain life. By definition, use of these medical devices is only during an emergency, and as such, the pilot and operation is afforded relief as outlined in FAR Parts 91, 135, and 121. That is not a blanket waiver to create a hazard, but the foreseeable hazards have already been addressed in AC 135-14 and AC 27-1B.		appropriate load factors relative to the helicopter such that the means for carrying the carry-on equipment does not fail. For instance, in the case of a carry-on incubator, the incubator is typically placed on top of an installed "mount" for the incubator. The "mount" is evaluated for a weight of the incubator. In some cases, an incubator may be completely self-contained and include other items such as oxygen bottles required for the incubator occupant. We agree these incubators are to sustain life. In order to sustain life, they may require items such as oxygen support. This must be evaluated such that sustaining a life using the incubator does not cause other safety issues. Carriage of these items needs to be evaluated for safely transporting the incubator with no safety issues to the helicopter or other occupants. The emergency condition of the patient being transported is unrelated to the operation of the helicopter, thus the flight is considered a normal flight, unless the helicopter experiences an emergency that may affect safe flight or landing. The helicopter must be safe for transporting of the occupants including those occupants being transported for a medical emergency condition. There are

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				specific requirements regarding the safety of the helicopter and the occupants of the helicopter that must be addressed.
AAMS/HAI/AMOA	Pg MG 6-5, para. b.(3)(iii)(B)	The AC also calls for a "placard indicating that the isolette should be evaluated per the guidance contained in AC 135-14 and restrained to the emergency landing load factors for rotorcraft occupants per 14 CFR 27.561(b)(3), or the appropriate reference based on the certification basis of the rotorcraft, should be placed in close proximity to the isolette mount location." This is an unnecessary and impractical requirement.	If the isolette is a certified installation, then the item should have a placard and restriction as part of type design. If the item is to be carried on board, it is the responsibility of the pilot to determine safe and appropriate restraint.	Not adopted; due to the size of the carry-on incubator, typical modification includes a platform or some other modification to restrain the incubator. The restraints are installed in the helicopter and are subject to the certification requirements for proper restraint of equipment. The placard would include the maximum weight approved for stowage or carriage on the modification such as a platform. All items in the helicopter occupant area are subject to the emergency landing requirements of 14 CFR 27.561. This would apply to large medical carry-on items such as an incubator, in that the carry-on items must be restrained to those requirements.

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AAMS/HAI/AMOA	Pg MG 6-5, para. b.(4)	The AC also states in part (4) that "Interior materials must meet the flammability standards in § 27.853 appropriate to the type design". This [Human Infant Incubators (Isolettes) and Other Removable Medical Equipment] is emergency equipment that is not designed for continuous aviation use. If the FAA means to apply this to carry-on items, including isolettes or other removable medical equipment, the industry strongly objects to this inclusion; this is a significant regulatory requirement and constitutes regulation. Isolettes, blankets, pillows, pads, medical supplies, and all other equipment not permanently installed in the aircraft cannot be subject to flammability requirements. That requirement would be simply unattainable, and the industry strongly objects to the inclusion of these requirements.	The AC must clearly explain that this does not include carry-on items, even those that may be included in other types of equipment. Nor should it be a requirement of certified isolette installations; these are not aviation items.	Not adopted; this paragraph is more related to an incubator as part of the EMS configuration. In these cases, flammability requirements of § 27.853 are evaluated and compliance is shown during the certification activity. In the case of the carry-on medical equipment such as incubators, this equipment is not included in the evaluation of the modification for certification. However, it is our understanding that most carry-on incubators are typically used and supplied by a medical facility, which has medical standards to address flammability of materials used for hospital bedding, such as blankets, pillows, etc. The intent of this guidance is to address the safety concerns associated with carrying this type of medical equipment and provide adequate information for the safety of the occupant of the incubator as well as the other occupants in the helicopter. Also, see paras b.(1)(iii) and b.(4)(ii) for further description of the requirements of medical carry-on equipment.

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AAMS/HAI/AMOA	Pg MG 6-15, para b.(13)	The AC references the regulation as forgone conclusion, even referencing the regulation's location within Part 135 (Section 135.605). There are many types of these devices currently on the market; they vary significantly in size, weight, capability, and cost. Any regulations concerning these devices will have a dramatic impact on the capability of operator to install the devices and the economic impact that requirement will have on the operation. This AC is not regulatory in nature and does not take into account the feasibility of the device requirements, the economic impact on the operation, and the timeline for implementing the rule. The capabilities of these devices would be a significant aspect of the rule requiring them, and should be a part of the regulation, not the guidance to the regulation.	The industry requests the opportunity to comment on a proposed rule to require these devices in the context of their capabilities, not proposed guidance.	Partially adopted; the public had the opportunity to comment on the proposed rulemaking. The guidance in this section (b.(13)) will apply only if installing these systems on a helicopter intending to operate under the Part 135 Helicopter Air Ambulance rule, if adopted. The recorded parameter listing has been reworded to better accommodate a wide variety of available recording systems. We agree – the AC is not regulatory. However, the guidance is based on certification experience and best practice. If an applicant decision is to follow the guidance, then the guidance must be followed as written. If there are no specific rules to address a new and novel feature, a special condition may be utilized. Upon issuance of the Final Rule, the AC will be reviewed before its issuance to ensure that it is compatible with the Final Rule.

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Casey DeLanghe, Sales Mgr., Appareo Systems, LLC, 1810 NDSU Research Circle N., Fargo, ND 58102	Pg MG 6-15, para *(13) Helicopter Flight Data Monitoring	FAA's intent to require flight data monitoring systems for EMS helicopters. The FAA should clarify the statement "A digital method of recording should be used to record the data."	A more appropriate statement would be, "FDM system data should be recorded and stored on digital media." I disagree that "the hardware device used for storing the data should be installed such that it is in the rear of the tail boom to provide the highest potential of survival in the event of a crash." While there is no dispute that the rear of the tail boom oftentimes sustains less damage than other parts of the aircraft in an accident, the majority of light-weight, low-cost FDM systems on the market are installed in the cabin/fuselage area and do not have remote data storage features. The proposed requirement to store data in the rear of the tail boom would be a technological and economic set-back to the adoption and installation of such systems.	Adopted; changed wording to address and clarify these items.
American Eurocopter	Pg Mg 6-15, para b.*(13)	Eurocopter commends the FAA's intent to require flight data monitoring systems for EMS helicopters.	Eurocopter recommends that FAA clarify the statement "A digital method of recording should be used to record the data." A more appropriate statement would be, "FDM system data should be recorded and stored on digital media."	Adopted; changed wording to address and clarify these items.

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NORTH Flight Data Systems	Pg MG 6-15, para *(13) LN 5-8	The set of parameters should be clearly defined in order to achieve measureable compliance and consistent results.	"The flight data monitoring system should be capable of capturing the minimum set of parameters as specified in Section *(13) (ii). NOTE: Use of image recording to better document cockpit activity is encouraged however not qualified as a means of data capture. It is highly recommended certificate holders employ a method to encrypt all video and data."	Not adopted; the guidance contained in this AC does not rule out the use of video or audio data capture as a means of compliance and does not intend to require any encryption of the data recorded. It is up to the applicant to select the best way to meet the needs of an FDM system and to justify those methods as acceptable.
NORTH Flight Data Systems	Pg MG 6-15 & 16, para *(13) LN 10 - 14	A clear set of data collection requirements will allow the establishment of a minimum requirement and therefore ensure ALL part 135 certificate holders meet the intent of 135.605 safety standards. With ambiguous requirements there will be no clear basis for certificate holders to show compliance.	"When used in conjunction with an FAA approved flight operations quality assurance (FOQA) program, part 135 certificate holders would be required to collect flight performance and operational data as defined in *(13) (ii) that characterizes the state of the helicopter and its subsystems for use in their safety program.."	Not adopted; the guidance contained in this AC on data collection requirements is intentionally ambiguous and non-prescriptive to allow applicants to comply with the requirement in a manner that suits their needs and operation accordingly. It is up to the applicant to select the best way to meet the needs of an FDM system and to justify those methods as acceptable.
NORTH Flight Data Systems	Pg MG 6-15, para *(13) LN 14 - 17	Current technologies readily afford the development of digital platforms for recording data. Current digital and hybrid digital airframes can produce detailed data. Technological challenges are equally balanced on analog vs digital airframes as the same effort needs to be expended in order to provide a system that has the quality, reliability, and safety the	A digital method of recording shall be used to record the data from the flight data monitoring system, and the hardware device used for storing the data should be installed such that meets the following crash survivability criteria. 1.) 1,000G impact shock along each direction for a duration of 5 (±1) milliseconds. 2.) 1,000 lb static crush for a continuous	Not adopted; the guidance contained in this AC does not rule out the use of video or audio data capture as a means of compliance and does not intend to require any encryption of the data recorded. It is up to the applicant to select the best way to meet the needs of an FDM system and to justify those methods as acceptable. The guidance on the location of the data storage device will be changed, with the

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		FAA STC process currently mandates. Use of image capturing devices should be strictly limited to capturing "situational nuances" within the cockpit. Memory location for crash investigation and that used for FOQA are two separate issues. The FAA should establish a "Crashworthy" set of criteria and allow the manufacturers to meet that requirement without driving physical placement. The requirement to have a memory device at the "end of the tailboom" significantly inhibits the likelihood that a certificate holder can easily obtain recorded data for frequent FOQA download. The EUROCAE ED-155 guidelines provides a clear set of crash protected equipment specifications avionics OEMs can design and build devices to meet.	period of 5 minutes. 3.) 1,100° C for 15 minutes."	reference to the tail boom removed.

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Jeff Mullin, Chief Avionics Inspector, Bell Helicopter Textron, Piney Flats, TN	Pg MG 6-16, para b.*(13) (Flight Data Monitoring System)	There is recommendation that "the hardware device used for storing the data should be installed such that it is in the rear of the tail boom…". The monocoque tail booms on the Bell Helicopter 206 and 407 models do not permit drilling or altering the structure to mount such devices. There may be other model aircraft which also face this situation that I am not familiar with.	Maybe the suggestion should state "the hardware device used for storing the data should be installed such that it is in the rear of the fuselage …". We can mount devices near where the tail boom mounts to the fuselage, but not in the tail boom, other than the flux valve and ballast which were designed into the tail boom.	Adopted; changed the guidance on the location of the data storage device with the reference to the tail boom removed.
American Eurocopter	Pg Mg 6-16, para b.(13)	Eurocopter disagrees that "the hardware device used for storing the data should be installed such that it is in the rear of the tail boom to provide the highest potential of survival in the event of a crash." While there is no dispute that the tail boom oftentimes sustains less damage than other parts of the aircraft in an accident, the majority of light-weight, low-cost FDM systems on the market are installed in the cabin/fuselage area and do not have remote data storage features.	Eurocopter believes the requirement to store data in the rear of the tail boom would be a technological and economic set-back to the adoption and installation of such systems and suggests that, instead of specifying a particular place, FAA specifies an objective to install the FDM system in a location that allows for easy operational access to download the data and where it is unlikely to be damaged or to cause injury to the occupants in case of a crash.	Adopted; changed the guidance on the location of the data storage device with the reference to the tail boom removed.

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NORTH Flight Data Systems	Pg MG 6-15, para *(13) LN 17 - 20	It should be specified that power should be supplied to the recording mechanism prior to engine start and that the device is to provide a backup battery sufficient to ensure continuous recording through intermittent power interruptions and for a period of a minimum of 60 seconds after elective aircraft shutdown. The purpose of such an addition is to facilitate the capture of data relative to an incident or accident occurring during engine start and for a period after an aircraft system failure resulting in a non-powered incident or accident.	The system should receive electrical power from the helicopter's bus that provides the maximum reliability without jeopardizing service to the essential or emergency loads, and be capable of being operated continuously from the time power is applied to the aircraft until 60 seconds from when power is removed from the aircraft.	Not adopted; the guidance in this AC does not intend to require operation of the FDM system after aircraft power is removed, in order to keep the complexity and cost of the system and its installation to a minimum.
NORTH Flight Data Systems	Pg MG 6-16, para *(13)(i) LN 21 - 23	We recommend the proposed sampling rates detailed in the Minimum Parameter List below. These rates are in line with Eurocae and FAA recorder guidelines and should be extended to any installed recording devices.	(i) Safety. "The applicant shall record the minimum set of parameters at the specified sampling rate listed in *(13)(ii)."	Not adopted; the guidance contained in this AC on data collection requirements is intentionally ambiguous and non-prescriptive to allow applicants to comply with the requirement in a manner that meets their needs and operation accordingly. It is up to the applicant to select the best way to meet the needs of an FDM system and to justify those methods as acceptable.

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NORTH Flight Data Systems	Pg MG 6-16, para *(13)(i) NOTE:	As recognized by current Helicopter Flight Data Monitoring certificate holders, the most desirable interval for downloading is on a daily basis. Since many helicopters operate in remote locations it is suggested that a weekly (7 day) interval be set as a minimum. The longer the interval the less impact the results will have on improving operational results.	NOTE: The duration between data downloads for the promotion of operational safety within the FOQA program is recommended to be done on a daily basis but not to exceed a Seven (7) calendar day interval.	Not adopted; the guidance contained in this AC on data collection requirements is intentionally ambiguous and non-prescriptive to allow applicants to comply with the requirement in a manner that suits their needs and operation accordingly. It is up to the applicant to select the best way to meet the needs of an FDM system and to justify those methods as acceptable.
AAMS/HAI/AMOA	Pg MG 6-16, para. b.(13)(ii)	The AC would require that FDM devices gather data points that were not discussed in the NPRM: positioning system time, positioning system latitude/ longitude, air speed or ground These capability requirements listed in this AC are an additional requirement and may not all be part of a singular device; these enhanced capabilities are a significant advancement over the items previously discussed in the NPRM.	They must be part of a subsequent notification and comment process.	Not adopted; as stated in previous comment, this guidance is based on certification experience and best practices for this type of installation on a helicopter. An applicant may follow the guidance or if there are no specific rules to address a new and novel feature, a special condition may be utilized.
American Eurocopter	Pg MG 6-16, para b.(13)(ii)	Eurocopter globally agrees with the proposed list of parameters.	However, this list should be a recommendation instead of a minimum list. Also, instead of the terms “Rotors,” “Transmission,” and “Engine Parameters,” which are ambiguous,	Partially adopted; the guidance contained in this AC on data collection requirements is intentionally ambiguous and non-prescriptive to allow applicants to comply with the requirement in a manner that suits their needs

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			Eurocopter recommends “NR (Main Rotor RPM)” and "Aircraft-specific transmission and engine parameters as desired for analysis". Furthermore, Eurocopter suggests that the FAA specify that parameters may be captured either digitally or graphically (via image recorder). A large portion of the existing HEMS fleet is analog aircraft. Especially for these aircraft, the requirement for all parameters to be recorded digitally would be cost prohibitive and technically complex. However, capturing such parameters graphically (via image recorder) is a simple, reliable, cost-effective method to accomplish the same goals, knowing that software and systems exist which are able to convert the images into recorded flight parameters. Lastly, Eurocopter suggests that if image recorders are used, the FAA should require that they are installed in such a way that the warning/caution unit on the instrument panel be included in the field of view.	and operation accordingly. The guidance contained in this AC does not rule out the use of video or audio data capture as a means of compliance and does not intend to require any encryption of the data recorded. It is up to the applicant to select the best way to meet the needs of an FDM system and to justify those methods as acceptable.

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Casey DeLanghe, Sales Mgr., Appareo Systems, LLC, 1810 NDSU Research Circle N., Fargo, ND 58102	Pg MG 6-16, para (13)(ii) Recording:	The proposed list of minimum parameters is acceptable with exception of the terms “Engine Parameters,” “Rotors” and “Transmission,” which are ambiguous and need to be further defined with regards to being referenced as minimum parameters.	A more appropriate parameter name for “Rotors” would be “Main Rotor RPM” if that is what is intended. Regarding the terms “Engine Parameters” and “Transmission,” which specific engine and transmission parameters does the FAA intend to require? The FAA should specify that the list of minimum parameters may be captured either digitally or graphically (via image recorder). A large portion of the existing HEMS fleet is analog aircraft. Especially for these aircraft, the requirement for all parameters to be recorded digitally would be cost prohibitive and technically complex. However, capturing such parameters graphically (via image recorder) is a simple, reliable, cost-effective method to accomplish the same goal.	Not adopted; the guidance contained in this AC on data collection requirements is intentionally ambiguous and non-prescriptive to allow applicants to comply with the requirement in a manner that meets their needs and operation accordingly The guidance contained in this AC does not rule out the use of video or audio data capture as a means of compliance and does not intend to require any encryption of the data recorded. It is up to the applicant to select the best way to meet the needs of an FDM system and to justify those methods as acceptable.

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NORTH Flight Data Systems	Pg MG 6-16. para *(13)(ii)	We believe the minimum parameter list and recording frequencies are easily attainable with today's technology on digital, hybrid, or analog aircraft.	The flight data monitoring system should be capable of capturing and recording the following minimum parameters at the sampling rates detailed below: **Parameter** **Sampling Rate (Hz)** Heading 4 1° resolution Pressure Altitude 2 ± 5 ft Radio Altitude 2 ± 5 ft Pitch Attitude 4 1° resolution Roll Attitude 4 1° resolution Positioning system time 1 GMT Positioning system latitude 1 Positioning system longitude 1 Indicated Airspeed 2 Kts Positioning system computed ground speed 1 Kts Roll rate 4 Pitch rate 4	Not adopted; the guidance contained in this AC on data collection requirements is intentionally ambiguous and non-prescriptive to allow applicants to comply with the requirement in a manner that suits their needs and operation accordingly. The guidance contained in this AC does not rule out the use of video or audio data capture as a means of compliance and does not intend to require any encryption of the data recorded. It is up to the applicant to select the best way to meet the needs of an FDM system and to justify those methods as acceptable.

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			Yaw rate in Deg/sec or G force 4 Ambient acoustic data Pilot Headphone Pilot Microphone Copilot Headphone Crew ICS **Parameter Sampling Rate (Hz)** Engine parameters Eng Speeds (Ng, Np) 2 Eng Temp (T1, MGT) 2 Eng Torque 2 Eng Oil Temp 2 Rotors – NR 2 Transmission – Oil Press & Temp 2	
NORTH Flight Data Systems	Pg MG 6-17. para *(13)(ii) NOTE	Due to the specific application of the AC to HEMS operations and the capture of ICS audio via the Pilot's headphone, consideration should be given to the HIPA rules.	NOTE: Recording individual pilots, using hot microphones, on separate pilot audio channels can provide useful information in the investigation of incidents and accidents. The certificate holder should ensure the handling of any patient information or audio is in accordance with HIPA rules.	Not adopted; this AC guidance is intended to assist the applicant with compliance to the 135 operation rule for HEMS, not to provide guidance on compliance or adherence to other agencies' requirements.

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Garmin	Pg MG 6-17, para b.(14)	This paragraph states: *(14) Radio Altimeter (RAD ALT). RAD ALTs are required to be installed in the pilot's primary field of view in all helicopters operating under a 14 CFR part 135 certificate. The minimum performance requirements for an FAA approved RAD ALT system can be found in TSO-C87. RAD ALT sensing equipment is often a remote mounted device that communicates its information with a display, which may be a standalone control head or integrated with a Primary Flight Display. Consequently, it is inappropriate to require the RAD ALT equipment itself to be "installed in the pilot's primary field of view".	Suggest revising the paragraph as follows: *(14) Radio Altimeter (RAD ALT). Display of radio altitude is required to be in the pilot's primary field of view …	Adopted; changed the guidance on RAD ALT to clarify this point.

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AAMS/HAI/AMOA	Pg MG 6-17, para. b.(16)(i)	The AC states that, since EMS installations are "a collection of several STC's" that "it should be shown the overall installation provides for safe operation of the aircraft". This statement is unnecessary, leaves too much open to interpretation by the inspector, and could lead to conflicting considerations in the approval process. It is clearly the installer's responsibility, and the inspector's duty, to ensure that the installation is complete and compatible with other installations and that the aircraft can be operated safely.	This statement is unnecessary in the AC.	Not adopted; this is a factual statement and is a beneficial reminder to the installer that the final helicopter installation configuration must be compliant and have no known features that may be a safety concern to the occupants or the helicopter.
AAMS/HAI/AMOA	Pg MG 6-18, para. b.(16)(vi)	The AC also recommends the installation of smoke detectors; this recommendation is unnecessary on air medical aircraft. While these devices serve a purpose on large cargo aircraft equipped for long flights at high altitudes, air medical flights, especially those conducted in helicopters, tend to be short flights conducted at low altitudes. Any indication of a fire would be readily apparent to medical personnel or flight crew.	This recommendation is unnecessary on air medical aircraft.	Not adopted; while the commenter may have this opinion, it is a recommendation that adds a safety benefit. Based on information we have seen, long distance medical operations do occur. Additionally, due to the nature of the equipment's use on a helicopter for emergency medical service, a fire could occur during a short flight also and could be just as serious regardless of the flight duration.

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AAMS/HAI/AMOA	Pg MG 6-18, para. b.(17)	The AC goes on to require that modifications of substitutions of equipment would require subsequent inspections. This is already required of the installer and does not need to be restated here. The restatement could cause subsequent inspections that unnecessarily tax FAA resources.	This does not need to be restated in the AC.	Not adopted; the purpose of this guidance is to address emergency medical installations on helicopters. There are many requirements associated with this guidance and the guidance brings all these requirements in a single document to address specifically the helicopter emergency medical configuration, which includes modifications resulting from equipment substitutions.