Recommendation 15-7: Line Oriented Flight Training (LOFT) and Scenario Based Training for Helicopter Air Ambulance (HAA) Operations

I. Submission

The recommendations below were submitted by the Air Carrier & Contract Training Workgroup (AC&CT WG) for consideration by the Air Carrier Training Aviation Rulemaking Committee (ACT ARC) Steering Committee on the May 29, 2015 Steering Committee Telcon (TEL-4). The ACT ARC Steering Committee adopted the recommendations with unanimous consent, and the recommendations are consolidated and submitted to the Associate Administrator for Aviation Safety (AVS-1) as ACT ARC Recommendation 15-7.

II. Statement of the Problem

The Federal Aviation Administration (FAA) Helicopter Air Ambulance (HAA) II Rulemaking Team posed a series of questions to the ACT ARC to obtain industry input for a Congressionally-mandated rulemaking and development of the associated guidance material. The following questions related to line oriented flight training (LOFT) for HAA operations were included in Part II of that tasking:

- Is LOFT different in an aircraft vs. LOFT in a Flight Simulation Training Device (FSTD)?
- Should LOFT include medical personnel or should they be simulated by the instructor?
- What does an HAA LOFT look like?

After the ACT ARC Steering Committee assigned the task to the AC&CT WG, the AC&CT WG formed the Helicopter Air Ambulance Training Action Team, which included industry subject matter experts to review, discuss, and propose recommendations in response to the questions posed.[1] The AC&CT WG previously proposed recommendations associated with Part I of the FAA tasking. (*See* ACT ARC Recommendations 15-3 and 15-4.) Those recommendations were adopted by the ACT ARC Steering Committee (with amendments) during the Steering Committee Meeting held in January 2015, and submitted to the Associate Administrator for Aviation Safety (AVS-1) on April 10, 2015. The FAA accepted Recommendations 15-3 and 15-4 and assigned them to the Air Transportation Division (AFS-200) for action. The recommendations were provided to the Commuter, On Demand, and Training Center Branch (AFS-250), which is the Office of Primary Responsibility (OPR) for the HAA II rulemaking and HAA policy.

[1] The HAA Training Action Team included subject matter experts representing operators and industry associations: Air Evac Lifeteam, Air Medical Operators Association (AMOA), Air Methods, California Shock Trauma Air Rescue (CALSTAR), Helicopter Association International (HAI), Metro Aviation, National EMS Pilots Association (NEMSPA), and PHI Air Medical.

III. Proposed Recommendations

The ACT ARC Steering Committee proposes the following recommendations for FAA consideration:

> The ACT ARC recommends the FAA develop guidance material that defines Helicopter Line Oriented Flight Training (HLOFT) as flight training conducted in the helicopter or FAA-approved Flight Simulation Training Device (FSTD) in a structured manner that allows and encourages the development and practical application of crew resource management (CRM) concepts. When practical, the ACT ARC recommends that actual medical crewmembers participate in the LOFT scenario.
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> In addition, the ACT ARC recommends the FAA develop guidance material that specifically explains the conditions under which (and devices in which) such training would qualify as HLOFT versus training that would not be considered flight training, including sample scenarios and training module content.
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> (Reference Attachment A to these Recommendations for *Helicopter Line Oriented Flight Training (HLOFT) Overview, Sample Phases and Scenario Development*.)
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> The ACT ARC further recommends the FAA develop guidance material encouraging Helicopter Air Ambulance (HAA) operators to incorporate HAA Scenario Based Training (HAASBT) into the operator's FAA-approved training program, especially in cases where the operator cannot conduct LOFT. HAASBT should be defined as a scenario-based training event developed by the analysis of current industry trends focused more on real-world decision making rather the than maneuvering the aircraft. HAASBT is not considered to be flight training, so it is scalable by nature because of the flexibility afforded regarding the device(s) used for the training.
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> (Reference Attachment B to these Recommendations for *HAASBT Overview, Sample Phases and Scenario Development*.)

IV. Rationale

The HAA Training Action Team reviewed current regulatory requirements for Part 135 operators, the new requirements in 14 CFR Part 135 Subpart L, and current FAA guidance material, including Advisory Circular (AC) 135-14B, Helicopter Air Ambulance Operations (3/26/15) during the discussions that lead to the recommendations above.

The HAA Training Action Team developed the recommendations after consideration of the differences between LOFT conducted in an aircraft vs. an FSTD. The Action Team discussed whether medical personnel should be included and discussed what an HAA LOFT scenario would look like.

Recommendations on HLOFT:

The overall goals of an HLOFT scenario would be the same as the goals for traditional LOFT conducted in an airplane or airplane FSTD. An HLOFT scenario concentrates and provides focus on considerations unique to HAA operations. For example, a functional and necessary difference between HLOFT and airplane LOFT would be the leg length, which would be reduced during a typical HAA operation. HLOFT would focus on the complexity associated with the overall mission as opposed to the enroute length. Instead of being programmed with a solution, the crew can manage the operational environment and process available information to learn its limits, properties, and operational significance.

HLOFT conducted during a simulator flight training session would allow the crew to practice primarily CRM skills in an uninterrupted realistic "line" environment. The design of HLOFT scenarios centers on CRM objectives unique to HAA operations, such as those found in 14 CFR 135.330.

The requirements under which HLOFT would be considered flight training are the same as the requirements for traditional LOFT conducted in an airplane or airplane FSTD. The recommendations on HLOFT take into account the limited number of FSTDs available to HAA operators and the limited circumstances under which such events would be considered flight training.

Recommendations on HAASBT:

In responding to the questions posed by the FAA regarding LOFT in Part I of the Tasking, the HAA Training Action Team developed the HAASBT experience event concept and associated recommendations to augment LOFT due to the limited equipment available to HAA operators in which they can get credit for flight training. HAASBT is designed to further enhance flight crew and other personnel soft skills in a training environment by fostering effective team participation and expectations in a variety of high stress environments. Using the experience event as part of a HAA training program will give the crewmember an opportunity to practice skills in a “realistic” environment. Structured guidance for HAASBT will be essential to its success because HAASBT is not flight training, so guidance for operators and inspectors will be required to ensure that operators can receive some ground training credit for incorporating HAASBT into the operator’s training program.

Since HAASBT would allow an HAA operator to use tabletop exercises and training devices (as appropriate to the task), the FAA provides a safety incentive, as well as an economic incentive to incorporate HAASBT into the operator’s training program.

While certain requirements apply to devices used to conduct LOFT, HAASBT could be conducted in training devices that meet the specific training objects of the HAASBT. Specific to the objectives of the HAASBT, the format of the training and required equipment may include a table top exercise, the utilization of AATD (Advanced Aviation Training Devices), the use of FSTDs or the use of an aircraft. Guidance for incorporating HAASBT into operator training programs is particularly important because of the limited simulator resources available to the helicopter industry. The scalability of the HAASBT is expected to encourage utilization of HAASBT and subsequently enhance safety. Additionally, with the flexibility of the HAASBT design, it provides a means to include medical personnel as active participants in HAASBT scenarios.

The HAA Training Action Team members noted Leading industry operators have been incorporating most of these tasks into “informal” training scenarios for years, and subsequent accident data supports that benefits from the training in preventing accidents.

V. Background Information

ACT ARC Initiative:

ACT ARC Recommendation 15-7 addresses Part II of the tasking associated with the following Steering Committee Initiative:

Initiative #31: Develop guidance for Helicopter Air Ambulance (HAA) operations under 14 CFR part 135 with regard to:

- HAA Pilot Training Program curriculums
- Incorporating Line Oriented Flight Training (LOFT) into pilot training curriculums
- Crew Resource Management (CRM) training

Source Requirement:

Public Law 112-95, § 44730. Helicopter air ambulance operations

§ 44730(e). SUBSEQUENT RULEMAKING.—
(1) IN GENERAL.—Upon completion of the rulemaking required under subsection (b), the Administrator shall conduct a follow-on rulemaking to address the following:
(A) Pilot training standards, including—
(i) mandatory training requirements, including a minimum time for completing the training requirements;
(ii) training subject areas, such as communications procedures and appropriate technology use; and
(iii) establishment of training standards in—
(I) crew resource management;
(II) flight risk evaluation;
(III) operational control of the pilot in command; and
(IV) use of flight simulation training devices and line-oriented flight training.
(B) Use of safety equipment that should be worn or used by flight crewmembers and medical personnel on a flight, including the possible use of shoulder harnesses, helmets, seatbelts, and fire resistant clothing to enhance crash survivability.
(2) DEADLINES.—Not later than 180 days after the date of issuance of a final rule under subsection (b), the Administrator shall initiate the rulemaking under this subsection.
(3) LIMITATION ON CONSTRUCTION.—Nothing in this subsection shall be construed to require the Administrator to propose or finalize any rule that would derogate or supersede the rule required to be finalized under subsection (b).

Note: Reference *Helicopter Air Ambulance, Commercial Helicopter, and Part 91 Helicopter Operations Final Rule* (79 FR 9932 published February 21, 2014—effective date extended to April 22, 2015) for Congressionally mandated rulemaking required by P.L. 112-95 § 44730(b).

Attachment A: Helicopter Line Oriented Flight Training (HLOFT) Overview, Sample Phases and Scenario Development

a. Overview. HLOFT conducted during simulator training session allows the crew to practice primarily CRM skills in an uninterrupted realistic "line" environment. The design of HLOFT scenarios centers on CRM objectives unique to HAA operations, such as those found in 14 CFR 135.330. Flight training credit for HLOFT is limited to flight training conducted in approved devices. CRM concepts that can be incorporated in HLOFT include, but are not limited to:

(1) Continual operational readiness and evaluation

(2) Authority of the pilot in command;

(3) Communication processes, decisions, and coordination, to include communication with Air Traffic Control, personnel performing flight locating and other operational functions, medical personnel and passengers;

(4) Creating and maintaining team integrity;

(5) Workload and time management;

(6) Situational awareness;

(7) Effects of fatigue on performance, avoidance strategies and countermeasures;

(8) Effects of stress and stress reduction strategies; and

(9) Aeronautical decision-making and judgment training tailored to the operator's flight operations and aviation environment.

b. Basic Elements. HLOFT is defined by the following basic elements and concepts:

(1) Takes place in an FAA-approved simulator (under 14 CFR Part 60) in a simulated line operational environment.

(2) Uses appropriate personnel or role players appropriate for the scenario.

(3) Contains real-world incidents, unfolding in real time.

(4) Used for "no-jeopardy" training,

(5) Contains scenarios and segments that run uninterrupted, and interactively accomplished.

(6) Contains scenarios tailored to the operator’s learning objectives.

(7) Incorporates CRM skills.

(8) Provides critique of individual and crew performance.

c. Structure. HLOFT is conducted in an environment that is structured to allow and encourages the development and the practical application of CRM concepts. Instead of being programmed with a solution, the crew can manage the operational environment and process available information to learn its limits, properties, and operational significance.

d. Phases. Phases of an HLOFT scenario include:

(1) Briefing. Before the flight segment begins, the instructor should brief crewmembers/medical personnel on the HLOFT scenario, including the training objectives, and the role of the instructor (i.e., the instructor is considered "not present," except as an air traffic controller (ATC), medical personnel, patient or as another ground- based entity. The role of the flight crew should be discussed in the briefing (e.g., flight crewmembers should perform their duties just as they would in line operations). Information about "the environmental setting of the scenario" should also be discussed.

(2) Preflight Planning Documents and Activities. Preflight planning documents (e.g., weather reports and risk assessments) should be prepared with the operator's particular training objectives in mind. For example, the operator may choose to have crewmember(s) (pilot) learn how to address unfavorable conditions, such as weather, maintenance, patient weight, size, and fuel loads, etc.

(3) Flight Scenario. The flight scenario includes events from flight acceptance to completion of post-flight tasks. Items may include; departure, en route, arrival, and post-flight tasks, as appropriate. It should also include the time in which communication with ATC and other ground agencies takes place.

(4) Debriefing. Debriefing should include feedback to crewmembers on their performance. Positive comments regarding crew performance should be emphasized in the debriefing as well as crew performance that needs improvement. The debriefing involves instructor critiques of individual crewmember(s) and of the team as a whole. Also, it is important that crewmember(s) be given the opportunity to critique and analyze their own performance and review key points.

e. Scenario Development. Scenarios should contain realistic circumstances such as messages from ATC or medical attendant interruptions. Scenarios should also be developed to observe checklist management procedures, standards, leadership qualities, assertiveness, crew coordination, communication and ground operations. Operators may use these elements to design full-length, real-time scenarios, as well as shorter scenarios that teach specific skills (e.g., unimproved landing zone considerations and assessments, special navigation equipment, operational environments unique to the operator or specific base).

Attachment B: Helicopter Air Ambulance Scenario Based Training (HAASBT) Overview, Sample Phases and Scenario Development

a. Overview. HAASBT can be conducted during a training session in a simulator, aircraft or other training aid that allows the crew to practice primarily CRM skills in an uninterrupted environment. The design of HAASBT scenarios centers on CRM objectives unique to HAA operations in addition to those found in 14 CFR 135.330. HAASBT is not flight training. The CRM concepts that can be incorporated in HAASBT include, but are not limited to:

(1) Continual operational readiness and evaluation;

(2) Authority of the pilot in command;

(3) Communication processes, decisions, and coordination, to include communication with Air Traffic Control, personnel performing flight locating and other operational functions, medical personnel and passengers;

(4) Creating and maintaining team integrity;

(5) Workload and time management;

(6) Situational awareness;

(7) Effects of fatigue on performance, avoidance strategies and countermeasures;

(8) Effects of stress and stress reduction strategies; and

(9) Aeronautical decision-making and judgment training tailored to the operator's flight operations and aviation environment.

b. Basic Elements. HAASBT is defined by the following basic elements and concepts:

(1) Takes place in a simulated line operational environment.

(2) Uses appropriate personnel or role players appropriate for the scenario.

(3) Contains real-world incidents, unfolding in real time.

(4) Used for "no-jeopardy" training,

(5) Contains scenarios and segments that run uninterrupted, and interactively accomplished.

(6) Contains scenarios tailored to the operator’s learning objectives.

(7) Incorporates CRM skills.

(8) Provides critique of individual and crew performance.

c. Sample Topics. HAASBT may include, but is not limited to, topics such as:

(1) Air Medical Resource Management (AMRM)

(2) Operational Control

(3) Confined Area Operations

(4) Patient Considerations

(5) Multiple Aircraft Operations

(a) Other considerations specific to operator's experience

(b) Lessons learned

(c) Review of accidents

(6) Base Oriented Training

(7) "Line" or "Base" Scenarios.

(8) Launch Sequence

(9) In-flight Diversions/Destination Changes

(10) Abnormal Medical Situations in flight, etc.

d. Structure. HAASBT is conducted in an environment that is structured to allow and encourages the development and the practical application of CRM concepts. Instead of being programmed with a solution, the crew can manage the operational environment and process available information to learn its limits, properties, and operational significance.

e. Phases. Phases of an HAASBT include:

(1) **Briefing.** Before the flight segment begins, the instructor should brief crewmembers/medical personnel on the HAASBT scenario, including the training objectives, and the role of the instructor (i.e., the instructor is considered "not present," except as an air traffic controller, medical personnel, patient or as another ground- based entity. The role of the flight crew should be discussed in the briefing (e.g., flight crewmembers should perform their duties just as they would in line operations). Information about "the environmental setting of the scenario" should also be discussed.

(2) **Preflight Planning Documents and Activities.** Preflight planning documents (e.g., weather reports and risk assessments) should be prepared with the operator's particular training objectives in mind. For example, the operator may choose to have crewmember(s) (pilot) learn how to address unfavorable conditions, such as weather, maintenance, patient weight, size, and fuel loads, etc.

(3) **Flight Scenario.** The flight scenario includes events from flight acceptance to completion of post-flight tasks. Items may include; departure, en route, arrival, and post-flight tasks, as appropriate. It should also include the time in which communication with ATC and other ground agencies takes place.

(4) **Debriefing.** Debriefing should include feedback to crewmembers on their performance. Positive comments regarding crew performance should be emphasized in the debriefing as well as crew performance that needs improvement. The debriefing involves instructor critiques of individual crewmember(s) and of the team as a whole. Also, it is important that crewmember(s) be given the opportunity to critique and analyze their own performance and review key points.

f. Scenario Development. Scenarios should contain realistic circumstances such as messages from ATC or medical attendant interruptions. Scenarios should also be developed to observe checklist management procedures, standards, leadership qualities, assertiveness, crew coordination, communication and ground operations. Operators may use these elements to design full-length, real-time scenarios, as well as shorter scenarios that teach specific skills (e.g., unimproved landing zone considerations and assessments, special navigation equipment, operational environments unique to the operator or specific base).