

Helicopter Safety Enhancement (H-SE) 23-05: Training on effects of adverse wind situations, particularly performance issues at low airspeed

Helicopter Safety Enhancement Action:	Government and industry to develop awareness and effective training information that addresses the hazards of adverse wind situations and the impacts to flight performance, especially when at low airspeed.
Lead Organization:	<ul style="list-style-type: none"> • Helicopter Association International (HAI) Training Committee • Air Methods Corporation • FAA Safety Team (FAAST) • Air Medical Operators Association (AMOA) • USHST Outreach Team
Statement of Work:	<p>In general, helicopter aerodynamics are very complex and while there is an academic requirement currently in all rotorcraft training, the content is often provided to trainers in a way that is an oversimplification. This creates a scenario that can result in trainers and students not realizing the limits of the knowledge they have acquired. The goal of this H-SE is to better illustrate the hazards posed by adverse winds on rotorcraft performance, especially when operating at low airspeeds. As an example, similar, but unrelated efforts, have been undertaken in the fixed-wing world around loss of control events and the use of Angle-of-Attack (AOA) indicators. Vertical flight operations at low airspeed are predictable when the air-circulation through the rotor system is able to maintain a steady-state. It can be visualized as a bubble of air circulating around the rotor system. If this bubble is disrupted, or “popped”, a corresponding loss of lift can result. This creates a performance scenario that is not indicated by any instruments and is not able to be planned through a chart, but rather is managed by the pilot through a combination of forethought, experience, knowledge of wind directions and intensity around the aircraft, distance from obstacles and power reserves available. Given that it is not currently possible to provide rotorcraft pilots with an indicator that shows an impending loss of lift, this H-SE seeks to promote effective training solutions for pilot decision making and more effective risk assessment during operations.</p> <p>Through implementation of this H-SE, rotorcraft pilot knowledge can be standardized and potentially more individuals can adapt effective critical decision making to these environmental performance factors. This should lead to an increase in sound aeronautical decision making, better judgment in managing risk, and more consistent compliance with rules and regulations established to ensure a safe aviation system.</p>

	<p>Project:</p> <ul style="list-style-type: none"> • Define Adverse Wind situations in terms of the individual operator (include single pilot, and operation specific considerations). • Promote knowledge base criteria and training strategies for effective risk management and decision making when operating at low airspeeds in vertical flight regimes. • Improve mentoring by engaging trainers and operators who have operational experience in these areas and are willing to act as champions of best practices. The intent is help the individual or organization being mentored to gain the knowledge and skill to establish effective decision making and safety in their own operations. 												
Accidents	<p>The following fatal accidents prompted this safety enhancement:</p> <p><i>(Need to pull reference accidents from USHST citations)</i></p>												
Relation to Current Aviation Community Initiatives:	TBD												
Performance Goal Indicators:	Deliverable product to allow for promotion of knowledge at Flight School and operator level. Consideration for future additions to FAA material and documents to change standard curriculum for all.												
Key Milestones	<table> <thead> <tr> <th>Total</th> <th>Months</th> <th>End Date:</th> </tr> </thead> <tbody> <tr> <td>Output 1:</td> <td>2</td> <td>Dec. 31, 2023</td> </tr> <tr> <td>Output 2:</td> <td>5</td> <td>Mar. 1, 2024</td> </tr> <tr> <td>Output 3:</td> <td>12</td> <td>Oct 1, 2024</td> </tr> </tbody> </table> <p>Completion: 12 months</p>	Total	Months	End Date:	Output 1:	2	Dec. 31, 2023	Output 2:	5	Mar. 1, 2024	Output 3:	12	Oct 1, 2024
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Output 1:	2	Dec. 31, 2023											
Output 2:	5	Mar. 1, 2024											
Output 3:	12	Oct 1, 2024											
Potential Obstacles:	<ul style="list-style-type: none"> • Effective outreach to the individual work force level across industry. • Gaining participation of enough organizations or individuals with an operational understanding of hazardous aerodynamics to participate and train others throughout the industry. 												
Detailed Implementation Plan Notes:	<ul style="list-style-type: none"> • Incorporate into existing FAA Outreach programs to include FAAST Team. • Promote through HAI, AMOA ALEA, NBAA, other comparable industry organizations and through 												

	helicopter industry conventions.
CICTT Code:	LOC, LALT
Output 1:	
Description:	Define Adverse Wind situations in terms of the individual operator (include single pilot, and operation specific considerations), to include definition of low-airspeed environment. Considerations include: Wind direction, wind velocity state, mechanical wind effects, main rotor and tail rotor performance planning, and control authority based on steady-state conditions.
Lead Organization:	HAI Training Workgroup and AMC Team
Supporting Organizations:	<ul style="list-style-type: none"> • Academia • USHST volunteers
Actions:	<ul style="list-style-type: none"> • Team will research existing hazardous aerodynamic condition definitions and incorporate information on impacts of wind flow when it is interrupted or has abrupt changes. • Create acceptable knowledge base to provide awareness around relationship between rotor air circulations and lift/ control authority at low airspeed. • Identify gaps in existing academia.
Output Notes:	The definition should be structured as something that the front-line work force can identify with and embrace as applicable to what they do on a day-to-day basis.
Time Line:	2 months
Target Completion Date:	December 31, 2023
Output 2	
Description:	Develop a supplemental briefing that can be incorporated into rotorcraft flight training events.
Lead Organization:	HAI Training work group and AMC Team
Supporting Organizations:	<ul style="list-style-type: none"> • USHST • FFAST
Actions:	<ul style="list-style-type: none"> • Develop a supplemental briefing that can be incorporated into rotorcraft flight training events. • Provide operational scenarios that illustrate the associated hazards of adverse wind and the impacts at low airspeeds
Output Notes:	Materials need to be structured in a manner to allow for easy dissemination to organizations, flight training schools, and individuals.
Time Line:	5 months

Target Completion Date:	Mar. 1, 2024
Output 3:	
Description:	Improve mentoring by engaging trainers and operators who have operational experience in these areas and are willing to act as champions of best practices. The intent is help the individual or organization being mentored to gain the knowledge and skill to establish effective decision making and safety in their own operations.
Lead Organization:	HAI Training Committee and USHST Outreach Team
Supporting Organizations:	<ul style="list-style-type: none"> • AMOA • FAAST
Actions:	<ul style="list-style-type: none"> • Team will establish a framework of existing aviation networks that could be used to establish a safety culture mentoring program. Intent is to use both individuals and organizations to serve in this capacity. • USHST Outreach Team Focus Groups will actively engage with their respective industry sectors to connect individuals or organizations to a mentor or directly promote informational tools. • USHST will lobby FAA to incorporate changes in materials.
Output Notes:	The intent in Output 3 is to move beyond presentations and general promotion. This output will result in discussions with FAA around changing material included in Helicopter Flight Training Handbook, Advisory Circulars and ACS/PTS products.
Time Line:	12 months
Target Completion Date:	Oct. 1, 2024