

**Helicopter Safety Enhancement (H-SE) 82:  
Helicopter Flight Data Monitoring**

<p><b>Safety Enhancement Action:</b></p>	<p>Technology/Equipment: FAA and industry promote installation and use of data recording devices (<i>e.g.</i>, HFDM, camera recording) for purposes of: (1) detection and monitoring of aircraft and engine limitations that were exceeded, (2) collecting and preserving more data relevant to accident investigation, and (3) detecting and correcting procedural noncompliance.</p>
<p><b>Expected Implementers:</b></p>	<ul style="list-style-type: none"> <li>• FAA – AVP-200, AFS-800</li> <li>• FAA – AIR Policy &amp; Innovation Division, Rotorcraft Standards Staff</li> <li>• FAA Safety Team (FAAST)</li> <li>• USHST Outreach Team</li> <li>• General Aviation Manufacturers Association (GAMA)</li> <li>• Helicopter Association International (HAI) Safety Committee</li> <li>• Helicopter Flight Data Monitoring (HFDM) Device Manufacturers</li> </ul>
<p><b>Statement of Work:</b></p>	<p>To help prevent fatal rotorcraft accidents due to Loss of Control Inflight (LOC-I), Unintended Instrument Meteorological Conditions (UIMC), and Low Altitude (LALT), the rotorcraft community would benefit from increased use of flight data monitoring. Helicopter Flight Data Monitoring (HFDM) devices, including audio/video recording devices, offer the ability to collect data on normal and off-nominal operations and have been proven to improve safety in other types of aviation communities.</p> <p>A review of the 52 LOC-I, UIMC, and LALT fatal accidents from the 2009–2013 USHST dataset indicated that the majority of fatal accidents that occurred had insufficient data surrounding the details of the helicopter’s state (<i>i.e.</i>, flight data, audio/video from the cockpit, control positions, etc.) when the event occurred. This is in direct contrast to commercial aviation where flight data recorders and cockpit voice recorders provide investigators and operators with a multitude of parameters for accident/incident investigation and trend/anomaly detection. Although some of the helicopters in the dataset did have flight data monitoring devices installed, they were in the minority. This clearly indicated to the working group that more needs to be done.</p>

Perhaps more importantly, data recording devices enable proactive intervention before an event occurs. Based on some of the fatal accidents in the 2009-2013 dataset, the USHST working group thought flight data monitoring system could have made a difference if it was operated as part of a voluntary safety program (ASIAS and other comparable programs). Hazardous behavior could have been identified with the opportunity to break the accident chain before it resulted in a fatality.

With the benefits evident from the USHST working group's analysis, this H-SE seeks to conduct a promotional safety campaign to encourage the industry to equip as many helicopters within the rotorcraft community with helicopter flight data monitoring recording devices as possible.

Project:

1. The FAA and industry to develop an educational outreach campaign that addresses the following:
  - a. Fundamentals of why the use of data recording devices is valuable to an owner/operator (What is HFDM? How can it be used? How is it part of an effective SMS?).
  - b. Specific examples of the benefits to using HFDM as described by success stories of those who were early adopters.
  - c. How data recording can work side by side with participation in voluntary safety programs such as Aviation Safety Information Analysis and Sharing (ASIAS) and provide information back to the owner/operator on trends and higher risk areas.
2. To better promote installation and use of data recording devices, the FAA should clarify the following policy issues:
  - a. Participation in "approved" vs. "unapproved" FOQA/FDM programs
  - b. Interpretation of major vs. minor change/alteration
  - c. Ability to seek a Field Approval vs. Supplemental Type Certificate for installation of Flight Data Recorders

	<p>d. Details of the Helicopter Flight Data Monitoring System (HFDMS) per the 2018 Helicopter Air Ambulance rule and AC 135-14B.</p> <p>The following 15 fatal accidents prompted this SE:</p> <table> <tr> <td>CEN10FA424</td> <td>ERA14FA010</td> </tr> <tr> <td>CEN10FA509</td> <td>WPR09FA104</td> </tr> <tr> <td>CEN12FA621</td> <td>WPR11FA239</td> </tr> <tr> <td>CEN13FA357</td> <td>WPR11FA350</td> </tr> <tr> <td>ERA09FA417</td> <td>WPR12FA282</td> </tr> <tr> <td>ERA10FA283</td> <td>WPR12LA259</td> </tr> <tr> <td>ERA10LA348</td> <td>WPR13FA080</td> </tr> <tr> <td>ERA13FA273</td> <td></td> </tr> </table>	CEN10FA424	ERA14FA010	CEN10FA509	WPR09FA104	CEN12FA621	WPR11FA239	CEN13FA357	WPR11FA350	ERA09FA417	WPR12FA282	ERA10FA283	WPR12LA259	ERA10LA348	WPR13FA080	ERA13FA273	
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<b>Relation to Current Aviation Community Initiatives:</b>	<ul style="list-style-type: none"> <li>• FAA Rotorcraft ASIAs HFDM Research</li> <li>• NTSB Goal – Expand Recorder Use to Enhance Safety</li> <li>• Previous IHST/USHST Safety Recommendation - Implement FDM Recorders in Helicopters</li> </ul>																
<b>Performance Goal Indicators:</b>	Effective outreach to rotorcraft community that clearly communicates the safety benefits of installing data recording devices.																
<b>Key Milestones:</b>	<table> <thead> <tr> <th></th> <th><u>Total Months</u></th> <th><u>Start Date</u></th> <th><u>End Date</u></th> </tr> </thead> <tbody> <tr> <td>Output 1:</td> <td>30</td> <td>Feb. 1, 2018</td> <td>Aug. 1, 2020</td> </tr> <tr> <td>Output 2:</td> <td>18</td> <td>Aug. 1, 2020</td> <td>Feb. 1, 2022</td> </tr> <tr> <td><b>Completion:</b></td> <td><b>48 months</b></td> <td></td> <td></td> </tr> </tbody> </table>		<u>Total Months</u>	<u>Start Date</u>	<u>End Date</u>	Output 1:	30	Feb. 1, 2018	Aug. 1, 2020	Output 2:	18	Aug. 1, 2020	Feb. 1, 2022	<b>Completion:</b>	<b>48 months</b>		
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<b>Potential Obstacles:</b>																	
<b>Detailed Implementation Plan Notes:</b>	<p>This H-SE relates to components of H-SE 100 (digital copilot). H-SE 100 also scored above the Mendoza Line. It involves some data collection although that device is more advisory/pilot-assist carry on equipment. More specifically, H-SE 100 states:</p> <p>Technology/Equipment. Industry to leverage the existing research on digital copilot sponsored by the GAJSC to create a low cost solution for the rotorcraft community.</p> <p>H-SE 82 also relates to H-SEs 13, 80, 89, 98, and 110, which fell below the Mendoza line:</p>																

	<ul style="list-style-type: none"> <li>a. IS 13, Outreach: FAA and industry establish an Infoshare for helicopter CFIs.</li> <li>b. IS 80, Technology/Equipment: Industry improve management of main rotor rpm during flight to include: 1) automated main rotor rpm management systems, 2) better annunciation/warning system for main rotor rpm.</li> <li>c. IS 89, Technology/Equipment: Industry develop smart cockpit technology that would assist in pilot decision making for landing guidance provided to the pilot color based (<i>e.g.</i>, HTAWS), pilot-worn (panel mount, EFB, or HWD), also aural alerting.</li> <li>d. IS 98, Technology/Equipment: Industry to work with owner of power and distribution line databases to fuse relevant and up to date wire data into pilot planning and enroute tools.</li> <li>e. IS 110: Training and Outreach. Improve education on the risks of operating in the low level environment. Education must address differences between flight in the low level environment for necessity of performing work (<i>e.g.</i>, aerial application spraying) as compared to unnecessary low-level transit flight when flight at a higher altitude is an option.</li> </ul> <p>With reference to the work of the GAJSC, this H-SE relates to GAJSC SCF-PP SEs 39 and 43 and to LOC SEs 14 and 22.</p> <p>Messaging of the promotion effort will be essential to building a foundation for success.</p> <ul style="list-style-type: none"> <li>a. Communication must avoid the “big brother” perception. The message should seek to educate operators on the benefit of being able to interpret their data and see how close they are to risks that perhaps they were previously unaware existed.</li> <li>b. If insurance companies supported this effort, they could be powerful advocates to helicopter owners.</li> <li>c. Find recommended practices (success stories) on the use of FDR and educate the helicopter community on them (as part of this, ask some of the operators already using HFDM). Dialogue this with manufacturers.</li> </ul>
<b>CICTT Code:</b>	LOC, UIMC, LALT

<b>Output 1:</b>	
<b>Description:</b>	<p>Develop an educational outreach campaign that address the following:</p> <ol style="list-style-type: none"> <li>a. Fundamentals of why the use of data recording devices is valuable to an owner/operator (What is HFDM? How can it be used? How is it part of an effective SMS?).</li> <li>b. Specific examples of the benefits to using HFDM as described by success stories of those who were early adopters.</li> <li>c. How data recording can work side by side with participation in voluntary safety programs such as Aviation Safety Information Analysis and Sharing (ASIAS) and provide information back to the owner/operator on trends and higher risk areas.</li> </ol>
<b>Lead Organization:</b>	USHST Outreach Team
<b>Supporting Organizations:</b>	<ul style="list-style-type: none"> <li>• FAA – AVP-200 &amp; ANG-E2</li> <li>• FAAST</li> <li>• HAI Safety Committee</li> <li>• HFDM Device Manufacturers</li> </ul>
<b>Actions:</b>	<ol style="list-style-type: none"> <li>1. USHST Outreach Team review current industry materials describing HFDM (<i>i.e.</i>, Fact Sheets, Toolkits, etc.) from USHST/IHST, Global HFDM Steering Group, Rotorcraft ASIAS HFDM research, etc. and develop modifications for new materials and media types (<i>i.e.</i>, audiovisual, mobile app, etc.) for the educational outreach campaign.</li> <li>2. USHST Outreach team work with the FAA, ANG-E2 to conduct HFDM Knowledge Sessions and safety seminars and outreach sessions at targeted events (<i>i.e.</i>, HeliExpo, Sun ‘N Fun, Oshkosh, ALEA, AMTC, Airshows, FAAST Team events, HAI World Helicopter Day, etc.).</li> <li>3. USHST Outreach Team and the FAA, ANG-E2 develop and implement a pilot program (<i>i.e.</i>, similar to the General Aviation Demo Project) for expanding recorder usage among targeted helicopter mission segments.</li> <li>4. The FAA and ANG-E2 collect helicopter flight test data from multiple helicopter types and mission segments for incorporation into ASIAS to demonstrate practical ASIAS capabilities to audiences during outreach.</li> </ol>
<b>Output Notes:</b>	The following is a summary of how data recording can work side by side with ASIAS.

	<p>ASIAS serves as a central conduit for the exchange of safety information between and among the Federal Aviation Administration (FAA) and others in the aviation community. ASIAS has become a national resource for the aggregation, analysis, and dissemination of aviation safety data and products. It serves as the central repository for data and analytical tools used to establish a shared service that enables the FAA to enhance its safety decision making with greater access to relevant data and powerful analytical tools.</p> <p>The aggregation and fusion of data from multiple sources in ASIAS will enrich the SMS process by enabling comprehensive analyses that provide a more complete understanding of contributing factors that extends beyond single root causes. Aggregation and fusion will also support the development of mitigation strategies and the measurement of their effectiveness. ASIAS provides risk assessment capabilities that can identify emerging safety issues that may otherwise be undetectable through individual data sources or unnoticed by operators who lack insight into hazards that are occurring across the NAS.</p>
<b>Time Line:</b>	30 months
<b>Target Completion Date:</b>	Aug. 1, 2020
<b>Output 2:</b>	
<b>Description:</b>	<p>To better promote installation and use of data recording devices, the FAA should clarify the following policy issues:</p> <ol style="list-style-type: none"> <li>a. Participation in “approved” vs. “unapproved” FOQA/FDM programs (<i>i.e.</i>, Advisory Circulars)</li> <li>b. Interpretation of major vs. minor change/alteration</li> <li>c. Ability to seek a Field Approval vs. Supplemental Type Certificate for installation of Flight Data Recorders</li> <li>d. Details of the Helicopter Flight Data Monitoring System (HFDMS) per the 2018 Helicopter Air Ambulance rule</li> </ol>
<b>Lead Organization:</b>	FAA – AFS-230/300
<b>Supporting Organizations:</b>	<ul style="list-style-type: none"> <li>• FAA – FSDOs</li> <li>• FAA – AIR Policy &amp; Innovation Division, Rotorcraft Standards Staff</li> <li>• GAMA</li> </ul>

<b>Actions:</b>	<ol style="list-style-type: none"> <li>1. FAA, AFS-230/300 clarify policy on “approved” vs/ “unapproved” HFOQA/HFDM programs to apply to helicopters.</li> <li>2. FAA, AFS-230/300 develop bulletin to FSDOs outlining the FAA policy for consistent application of Field Approval vs. STC decision path for installation of safety-enhancing equipment such as HFDM devices.</li> <li>3. FAA, AFS-230/300 consider necessity for any further guidance (Advisory Circular, Order, etc.) that would remove perceived barriers and increase operators voluntary installing data recording devices.</li> </ol>
<b>Output Notes:</b>	The FAA believes that this can be done with updates to advisory circulars, as well as any policy/guidance documents and not through rulemaking.
<b>Time Line:</b>	18 months
<b>Target Completion Date:</b>	Feb. 1, 2022