

**Helicopter Safety Enhancement (H-SE) 70:
Stability Augmentation System (SAS) / Autopilot**

Safety Enhancement Action:	Technology/Equipment: Industry and FAA to encourage development and installation of a stability augmentation system (SAS) and/or simple autopilot in light helicopters.
Expected Implementers:	<ul style="list-style-type: none"> • FAA – AIR, Policy & Innovation Division, Rotorcraft Standards Staff • FAA – AIR, Compliance & Airworthiness Division • FAA/EASA Part 27 Rewrite Committee • USHST – Outreach Team • HAI – Technical Committee • Aircraft Electronics Association (AEA) • Electronics manufacturers (GAMA to coordinate) • Helicopter manufacturers (GAMA to coordinate) • Helicopter flight training providers
Statement of Work:	<p>The USHST Safety Analysis Team identified loss of control inflight (LOC-I) as one of the top three most common occurrence categories of fatal civil helicopter accidents in their 2009-2013 dataset. Current light helicopters have flight characteristics that are challenging and demanding of pilot work load. The purpose of this H-SE is to increase safety by encouraging the development and installation of stability augmentation system (SAS) or autopilot devices that increase the flight stability of light helicopters.</p> <p>SAS/autopilot devices must be designed to reduce the incidence of loss of control inflight (LOC-I), and should consider new and retrofit configurations not currently supported by similar devices. The devices should also consider low visibility, low ceilings, and unintended IMC, and preferably enhance safety without requiring pilot action. A SAS/autopilot device may embody commercial off-the-shelf (COTS) pneumatic, electronic, MEMS or mechanical devices to sense or control helicopter motion.</p> <p>Project:</p> <ol style="list-style-type: none"> 1. USHST to coordinate formation of H-SE 70 team.

	<ol style="list-style-type: none"> 2. H-SE 70 team to meet with FAA regarding certification pathways for SAS/autopilot technology for light helicopters. 3. H-SE 70 team to draft White Paper that identifies the need and pathways to certification for SAS/autopilot technology for light helicopters. White Paper should discuss available options as well as future technological needs. 4. H-SE 70 team to promote White Paper to FAA (including Parts 27/29 rewrite working groups) and industry. <p>The following fatal accidents prompted this safety enhancement:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">WPR10FA055</td> <td style="width: 50%;">CEN13FA003</td> </tr> <tr> <td>CEN13FA010</td> <td>WPR13FA080</td> </tr> <tr> <td>ERA09FA537</td> <td>ERA13FA273</td> </tr> <tr> <td>CEN11FA468</td> <td>WPR13GA128</td> </tr> </table>	WPR10FA055	CEN13FA003	CEN13FA010	WPR13FA080	ERA09FA537	ERA13FA273	CEN11FA468	WPR13GA128
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<p>Relation to Current Aviation Community Initiatives:</p>	<ul style="list-style-type: none"> • Current SAS/autopilot systems exist. • Non required Safety Enhancing Equipment (NORSEE) is a reduced certification burden afforded to safety enhancing equipment that is not required by existing regulations. <p>http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/0/5C598C7741CE2FC286257B7B00647060?OpenDocument. FAA is considering a NORSEE autopilot.</p>								
<p>Performance Goal Indicators:</p>	<ul style="list-style-type: none"> • Meeting with FAA concerning certification pathways. • Drafting for H-SE 70 White Paper. • Promotion of White Paper to FAA. • Promotion of White Paper to industry. 								

Key Milestones:	<u>Total Months</u>	<u>Start Date</u>	<u>End Date</u>
	Output 1: 2	Oct. 1, 2017	Dec. 1, 2017
	Output 2: 6	Dec. 1, 2017	Jun. 1, 2018
	Output 3: 23	Jun. 1, 2018	May 1, 2020
	Output 4: 6	May 1, 2020	Nov. 1, 2020
	Completion: 37 months		
Potential Obstacles:	Coordinating meetings with regulatory authorities. Economic feasibility.		
Detailed Implementation Plan Notes:	The following considerations may impact recommendations addressed in the White Paper: <ul style="list-style-type: none"> i. Existing technology solutions should be examined first. ii. The weight penalties of adding a SAS/autopilot to smaller Part 27 rotorcraft are important. iii. Assess if Approved Model List Supplemental Type Certificate (AML-STC) is a realistic option. iv. Consider increasing inherent stability as part of initial light helicopter design. 		
CICTT Code:	LOC-I, UIMC		
Output 1:			
Description:	USHST to coordinate formation of H-SE 70 team.		
Lead Organization:	USHST		
Supporting Organizations:	HAI – Technical Committee, OEMs (GAMA to coordinate)		
Actions:	USHST to convene team of subject matter experts to support H-SE 70.		
Output Notes:			
Time Line:	2 months		
Target Completion Date:	Dec. 1, 2017		
Output 2:			
Description:	Meet with FAA regarding certification pathways for SAS/autopilot technology for light helicopters.		
Lead Organization:	H-SE 70 Team		

Supporting Organizations:	<ul style="list-style-type: none"> • FAA – AIR, Policy & Innovation Division, Rotorcraft Standards Staff • HAI – Technical Committee • Electronics manufacturers (GAMA to coordinate) • Helicopter manufacturers (GAMA to coordinate)
Actions:	<ol style="list-style-type: none"> 1. H-SE 70 team to coordinate meeting with FAA – Rotorcraft Standards Staff to: <ol style="list-style-type: none"> a. Describe the need for a SAS/Autopilot system for light helicopters to FAA b. Describe SAS/Autopilot system safety benefits to FAA c. Discuss potential paths for certification. Key points should include any potential NORSEE path, how to ensure maximum relief from DO178/254, and best path for reduced certification burdens from FAA.
Output Notes:	
Time Line:	6 months
Target Completion Date:	June 1, 2018
Output 3:	
Description:	Draft White Paper that identifies the need and pathways to certification for SAS/autopilot technology for light helicopters.
Lead Organization:	H-SE 70 team
Supporting Organizations:	<ul style="list-style-type: none"> • HAI – Technical Committee • Electronics manufacturers (GAMA to coordinate) • Helicopter manufacturers (GAMA to coordinate)
Actions:	<ol style="list-style-type: none"> 1. H-SE 70 team to draft White Paper. 2. H-SE 70 team to submit White Paper to USHST Steering Committee for review and approval.
Output Notes:	<p>White Paper should discuss available technological options as well as future technological needs. A SAS/autopilot device may embody COTS pneumatic, electronic, MEMS or mechanical devices to sense or control helicopter motion.</p> <p>White Paper should address retrofitting existing fleet as well as implementation in new aircraft. Retrofit should be realistically bounded and perhaps prioritization should be assigned to those makes/models of helicopters that make up the largest percentage of the U.S. fleet.</p>
Time Line:	23 months
Target Completion Date:	May 1, 2020

Output 4:	
Description:	Promote White Paper to FAA (including Parts 27/29 rewrite working groups) and industry.
Lead Organization:	H-SE 70 team
Supporting Organizations:	<ul style="list-style-type: none"> • USHST Outreach Team • FAA – AIR, Policy & Innovation Division, Rotorcraft Standards Staff • FAA – AIR, Compliance & Airworthiness Division
Actions:	<ol style="list-style-type: none"> 1. H-SE 70 team to promote White Paper to FAA. 2. H-SE 70 team to promote White Paper to industry.
Output Notes:	Promotion should include electronic or in-person meetings. Team may want to coordinate with FAA/EASA Part 27 Rewrite Committee.
Time Line:	6 months
Target Completion Date:	Nov. 1, 2020