

**Helicopter Safety Enhancement (H-SE) 75:
Technology to Prevent Unintended Loss of Engine Power**

Safety Enhancement Action:	Technology/Equipment: Industry and FAA to encourage development and installation of Full Authority Idle Protection devices to prevent unintended loss of engine power.
Expected Implementers:	<ul style="list-style-type: none"> • FAA – AIR, Policy & Innovation Division, Rotorcraft Standards Staff • FAA – AIR, Compliance & Airworthiness Division • USHST – Outreach Team (primarily Personal/Private and Aerial Application Focus Groups) • HAI – Technical Committee • Electronics manufacturers, Piston Engine manufacturers, and Helicopter manufacturers (GAMA to coordinate)
Statement of Work:	<p>This H-SE was intended primarily targeted at unintended loss of engine power in piston engine helicopters. Rapid throttle reduction is one of the common scenarios in which this situation can occur.</p> <p>Within the USHST LOC-I dataset, one fatal accident involved rapid throttle chop resulting in loss of engine power. The FAA and industry should encourage the development and installation of full authority idle protection (FAIP) devices (comparable to a full authority digital engine control or FADEC). This would increase safety by reducing the risk of engine stoppage during flight training maneuvers, particularly simulated engine failure in a piston helicopter. The type of device being suggested would be capable of ensuring the engine remains running at a nominal RPM despite a pilot making a rapid throttle reduction.</p> <p>The device may embody commercial off-the shelf (COTS) pneumatic, electronic or mechanical control to ensure the engine remains running at a practical RPM during a throttle chop. Fuel, spark, air and throttle plate position are the parameters to be controlled. The device may embody a COTS warning light or aural tone to indicate actual engine stoppage or FAIP system activation. The device is expected to function similar to COTS idle speed controls on automobiles, which have authority to maintain idle despite changing loads or driver inputs.</p> <p>Project:</p> <ol style="list-style-type: none"> 1. USHST to coordinate formation of H-SE 75 team. 2. H-SE 75 team to meet with the FAA regarding certification pathways for FAIP devices.

	<p>3. H-SE 75 team to draft White Paper that identifies the need, technological options, and pathways to certification for FAIP devices.</p> <p>4. H-SE 75 team to promote White Paper to the FAA and industry.</p> <p>The following fatal accident prompted this safety enhancement: ERA10FA283</p>																								
<p>Relation to Current Aviation Community Initiatives:</p>	<ul style="list-style-type: none"> • Current FADEC controls on turbine engines, FADEC controls on the Porsche PFM piston aircraft engine, and current automotive technology. Each of these existing technologies provides active management of RPM that would be pertinent to throttle chop protection. • FAA and EASA have recently certified FADEC systems on turbo diesel engines with single power generation systems with 2 or more battery backups. • NORSEE is a reduced certification burden afforded to safety enhancing equipment that is not required by existing regulations. • Robinson Safety Notice (SN) 27, “Surprise Throttle Chops Can Be Deadly” https://robinsonheli.com/robinson-safety-notice/ • FAA Special Airworthiness Information Bulletin (SAIB) SW-12-12, Conducting Engine Failure Simulation in Helicopters with Reciprocating Engines. http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/0/8a901c9f99a4948c862579830058d9a8/\$FILE/SW-12-12.pdf 																								
<p>Performance Goal Indicators:</p>	<ul style="list-style-type: none"> • Meeting with the FAA concerning certification pathways. • Drafting for H-SE 75 White Paper. • Promotion of White Paper to the FAA. • Promotion of White Paper to industry. 																								
<p>Key Milestones:</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Total Months</u></th> <th style="text-align: center;"><u>Start Date</u></th> <th style="text-align: center;"><u>End Date</u></th> </tr> </thead> <tbody> <tr> <td>Output 1:</td> <td style="text-align: center;">2</td> <td style="text-align: center;">June 1, 2018</td> <td style="text-align: center;">Aug. 1, 2018</td> </tr> <tr> <td>Output 2:</td> <td style="text-align: center;">3</td> <td style="text-align: center;">Aug. 1, 2018</td> <td style="text-align: center;">Nov. 1, 2018</td> </tr> <tr> <td>Output 3:</td> <td style="text-align: center;">12</td> <td style="text-align: center;">Nov. 1, 2018</td> <td style="text-align: center;">Nov. 1, 2019</td> </tr> <tr> <td>Output 4:</td> <td style="text-align: center;">6</td> <td style="text-align: center;">Nov. 1, 2019</td> <td style="text-align: center;">May 1, 2019</td> </tr> <tr> <td>Completion:</td> <td style="text-align: center;">23 months</td> <td></td> <td></td> </tr> </tbody> </table>		<u>Total Months</u>	<u>Start Date</u>	<u>End Date</u>	Output 1:	2	June 1, 2018	Aug. 1, 2018	Output 2:	3	Aug. 1, 2018	Nov. 1, 2018	Output 3:	12	Nov. 1, 2018	Nov. 1, 2019	Output 4:	6	Nov. 1, 2019	May 1, 2019	Completion:	23 months		
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Completion:	23 months																								

Potential Obstacles:	Coordinating meetings with regulatory authorities.
Detailed Implementation Plan Notes:	
CICTT Code:	LOC-I
Output 1:	
Description:	USHST to coordinate formation of H-SE 75 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 75.
Output Notes:	
Time Line:	2 months
Target Completion Date:	Aug. 1, 2018
Output 2:	
Description:	Meet with the FAA regarding certification pathways for FAIP devices.
Lead Organization:	H-SE 75 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:	H-SE 75 team to coordinate meeting with FAA – Rotorcraft Standards Staff to: <ol style="list-style-type: none"> a. Describe the need for a FAIP in certain piston helicopters. b. Describe safety benefits. c. Discuss potential certification paths and availability of Non Required Safety Enhancing Equipment (NORSEE) path.
Output Notes:	
Time Line:	3 months
Target Completion Date:	Nov. 1, 2018
Output 3:	
Description:	Draft White Paper that identifies the need, technological options, and pathways to certification for FAIP devices.

Lead Organization:	H-SE 75 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 75 team to draft White Paper that identifies the need and pathways to certification for FAIP technology for light helicopters. 2. H-SE 75 team to submit White Paper to USHST Steering Committee for review and approval.
Output Notes:	
Time Line:	12 months
Target Completion Date:	Nov. 1, 2019
Output 4:	
Description:	Promote White Paper to the FAA and industry.
Lead Organization:	H-SE 75 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 • FAA/EASA part 27 Rewrite Committee
Actions:	<ol style="list-style-type: none"> 1. H-SE 75 team to promote White Paper to the FAA. 2. H-SE 75 team to promote White Paper to industry.
Output Notes:	Promotion should include electronic or in-person meetings.
Time Line:	6 months
Target Completion Date:	May 1, 2019