

**Helicopter Safety Enhancement (H-SE) 127A  
Training for Recognition/Recovery of Spatial Disorientation**

<p><b>Safety Enhancement Action:</b></p>	<p>Industry develop training for recognition of spatial disorientation and recovery to controlled flight. The training developed should emphasize the use of all available resources installed on the aircraft (to include automation, such as increased use of autopilot).</p>
<p><b>Expected Implementers:</b></p>	<ul style="list-style-type: none"> <li>• USHST Special Emphasis Area (SEA) Training Team</li> <li>• FAA – Civil Aerospace Medical Institute (CAMI)</li> <li>• FAA – AFS-800, AFS-600, AFS-200</li> <li>• Helicopter Association International (HAI)</li> <li>• General Aviation Manufacturers Association (GAMA)</li> <li>• flight simulation providers</li> <li>• flight training providers</li> <li>• Flight Safety Foundation</li> <li>• Aircraft Owners and Pilots Association (AOPA)</li> <li>• University Aviation Association (UAA)</li> <li>• Redbird</li> <li>• Embry-Riddle Aeronautical University (ERAU)</li> </ul>
<p><b>Statement of Work:</b></p>	<p>To help prevent fatal helicopter accidents resulting from spatial disorientation (SD), the helicopter community should promote the wider use of available SD simulation technology and training scenarios to create further awareness of impairment from SD and how to recover from such an event.</p> <p>Within the UIMC dataset, there were five accidents where a pilot’s incapacitation by spatial disorientation was either the cause or a contributing factor to the accident. This H-SE proposes education initiatives and use of SD simulation as part of the helicopter simulator training sessions.</p> <p>Intervention Strategy (IS) 132 was merged into H-SE 127A. IS 32 recommended training by industry to emphasize the use of all available resources installed on the aircraft (to include automation, such as as increased use of autopilot).</p> <p>Project:</p> <ol style="list-style-type: none"> <li>1. Review existing SD training products for inclusion in helicopter specific SD training.</li> <li>2. Create helicopter unique SD training products to include simulation technology.</li> </ol>

	<p>3. Distribute SD training products to flight training providers and owners/operators and track use of SD training products.</p> <p>The following five fatal accidents prompted this SE:  CEN10FA509      ERA13FA273  CEN13FA096      ERA13FA336  ANC13GA036</p>																				
<p><b>Relation to Current Aviation Community Initiatives:</b></p>	<ul style="list-style-type: none"> <li>• FAA and GA Community <i>Fly Safe</i> campaign: <a href="https://www.faa.gov/news/updates/?newsId=83106">https://www.faa.gov/news/updates/?newsId=83106</a></li> <li>• FAA Safety Team: Spatial Disorientation awareness training: <ul style="list-style-type: none"> <li>○ Part 1: <a href="https://www.faa.gov/tv/?mediaId=462">https://www.faa.gov/tv/?mediaId=462</a></li> <li>○ Part 2: <a href="https://www.faa.gov/tv/?mediaId=463">https://www.faa.gov/tv/?mediaId=463</a></li> </ul> </li> <li>• NBAA Top Safety Focus Areas: <a href="https://www.nbaa.org/ops/safety/top-safety-focus-areas/2015/">https://www.nbaa.org/ops/safety/top-safety-focus-areas/2015/</a></li> </ul>																				
<p><b>Performance Goal Indicators:</b></p>																					
<p><b>Key Milestones:</b></p>	<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 15%; text-align: center;"><u>Total Months</u></th> <th style="width: 20%; text-align: center;"><u>Start Date</u></th> <th style="width: 20%; text-align: center;"><u>End Date</u></th> </tr> </thead> <tbody> <tr> <td>Output 1:</td> <td style="text-align: center;">6</td> <td style="text-align: center;">Dec. 1, 2017</td> <td style="text-align: center;">June 1, 2018</td> </tr> <tr> <td>Output 2:</td> <td style="text-align: center;">24</td> <td style="text-align: center;">June 1, 2018</td> <td style="text-align: center;">June 1, 2020</td> </tr> <tr> <td>Output 3:</td> <td style="text-align: center;">4</td> <td style="text-align: center;">June 1, 2020</td> <td style="text-align: center;">Oct. 1, 2020</td> </tr> <tr> <td colspan="4" style="padding-top: 10px;"><b>Completion: 34 months</b></td> </tr> </tbody> </table>		<u>Total Months</u>	<u>Start Date</u>	<u>End Date</u>	Output 1:	6	Dec. 1, 2017	June 1, 2018	Output 2:	24	June 1, 2018	June 1, 2020	Output 3:	4	June 1, 2020	Oct. 1, 2020	<b>Completion: 34 months</b>			
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<p><b>Potential Obstacles:</b></p>	<p>Availability and cost pose two potential obstacles.</p> <p>Commercially available non-transportable SD training products are limited in number and location making it difficult for a large segment of the pilot population to experience and benefit from practical such demonstrations. The FAA has two small transportable SD simulation products available for limited public use at large aviation meetings or at the Civil Aerospace Medical Institute. Other Federal agencies, such as NASA and DOD, have SD training product capabilities but these are not available to the general public, and are used for research or military aircrew and astronaut training.</p> <p>There is one company in the U.S. and one in Europe that design, manufacture and market SD training products – they also provide on-site training services. Costs to purchase or train can vary depending on the capabilities of the training</p>																				

	<p>product. Some of the available devices offer very realistic simulation of linear and angular acceleration illusions and visual illusions. In addition, some of these simulators are rotorcraft specific.</p> <p>Although devices exist that demonstrate SD events, they are not widely used in aviation training curricula. SD is mentioned in most simulation training sessions; however, it is frequently an information event with little or no practical demonstrations. The practical demonstration of SD incapacitation and the recovery techniques for such an event are the key components to help reduce accidents resulting from this deadly physiological impairment. This type of practical training should be done on an initial and recurring basis. Ways to overcome the potential obstacles of availability and cost must be found.</p>
<b>Detailed Implementation Plan Notes:</b>	<p>Additional review is needed to assess the current availability of commercial SD simulators and/or training. The feasibility of making this training widely available is the primary consideration. In addition, more effective communication on the dangers of SD must be developed.</p> <p>Current providers of helicopter simulator training would have to validate the introduction of such additional simulation into their initial and recurrent training curricula. Furthermore, FAA would need to determine if such practical training should be recommended or mandated as part of recurrent airman certification.</p> <p>Examples of currently available SD training products can be found at:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.etcaircrewtraining.com">www.etcaircrewtraining.com</a></li> <li>• <a href="http://www.amst.co.at/en/aerospace-medicine/training-simulation-products/airfox/airfox-asd/">http://www.amst.co.at/en/aerospace-medicine/training-simulation-products/airfox/airfox-asd/</a></li> <li>• <a href="http://www.amst.co.at/en/aerospace-medicine/training-simulation-products/airfox/airfox-diso/">http://www.amst.co.at/en/aerospace-medicine/training-simulation-products/airfox/airfox-diso/</a></li> </ul>
<b>CICTT Code:</b>	UIMC
<b>Output 1:</b>	
<b>Description:</b>	Review existing SD training products for inclusion in helicopter specific SD training.
<b>Lead Organization:</b>	USHST SEA Training Team
<b>Supporting Organizations:</b>	<ul style="list-style-type: none"> <li>• HAI</li> <li>• CAMI</li> <li>• GAMA</li> <li>• Flight simulation providers</li> <li>• UAA</li> <li>• Flight Safety Foundation</li> </ul>

	<ul style="list-style-type: none"> <li>• AOPA</li> <li>• Redbird</li> <li>• ERAU</li> </ul>
<b>Actions:</b>	<ol style="list-style-type: none"> <li>1. Research and review current SD products available (GAMA facilitate via survey).</li> <li>2. USHST SEA Training Team will review GAMA survey results to determine if current materials meet needs.</li> <li>3. If USHST Special Areas Training Team finds current materials are inadequate, they will create a requirements document to define unmet needs. This may involve outreach to simulator providers or other research entities.</li> </ol>
<b>Output Notes:</b>	
<b>Time Line:</b>	6 months
<b>Target Completion Date:</b>	June 1, 2018
<b>CICTT Code:</b>	UIMC
<b>Output 2:</b>	
<b>Description:</b>	Create helicopter unique SD training products to include simulation technology.
<b>Lead Organization:</b>	USHST SEA Training Team
<b>Supporting Organizations:</b>	<ul style="list-style-type: none"> <li>• Flight training providers</li> <li>• Flight simulator providers</li> </ul>
<b>Actions:</b>	<ol style="list-style-type: none"> <li>1. Define SD scenarios for emphasis in training products (use the 52 fatal accidents analyzed by the USHST LOC-I/UIMC/LALT working group as starting point).</li> <li>2. Coordinate education materials to defined simulation technology.</li> <li>3. Create educational materials (fact sheets, articles, videos, lesson plans, scenarios, etc).</li> <li>4. Report completion to USHST SAT.</li> </ol>
<b>Output Notes:</b>	
<b>Time Line:</b>	24 months
<b>Target Completion Date:</b>	June 1, 2020
<b>CICTT Code:</b>	UIMC
<b>Output 3:</b>	
<b>Description:</b>	Distribute SD training products to flight training providers and owners/operators.

<b>Lead Organization:</b>	USHST Outreach Team
<b>Supporting Organizations:</b>	<ul style="list-style-type: none"> <li>• FAAST</li> <li>• HAI</li> </ul>
<b>Actions:</b>	<ol style="list-style-type: none"> <li>1. Use all available media outlets (Rotor Safety Challenge at Heli Expo, regional FAAST conferences, other safety conferences) to promote and distribute SD training products and technology.</li> <li>2. USHST Outreach Team will track use of SD training products. <ol style="list-style-type: none"> <li>a. Track purchase, usage, and installation of SD training products and simulation technologies.</li> <li>b. Survey whether end users find the new products effective.</li> </ol> </li> </ol>
<b>Output Notes:</b>	
<b>Time Line:</b>	4 months ( <i>to release initial training products</i> )
<b>Target Completion Date:</b>	Oct. 1, 2020
<b>CICTT Code:</b>	UIMC