

**USHST Helicopter Safety Enhancement (H-SE):  
Fatigue Risk Management**

<b>Helicopter Safety Enhancement Action:</b>	Operators to establish a Fatigue Risk Management Program (FRMP) based on a quantitative objective framework to identify elevated fatigue risk and aid in the selection of risk controls.
<b>Lead Organization:</b>	Pulsar Informatics
<b>Statement of Work:</b>	<p>Fatigue risk impacts all aspects of rotorcraft operations, including air crew, ground crew and support personnel whose mission-critical activities ensure safe and effective operations.</p> <p>Since 1990 NTSB has conducted 6521 helicopter accident investigations. Of these investigations, 28 have cited fatigue or lack of adequate sleep as a contributing factor, which have resulted in 19 fatalities and 18 injuries. Of these, human factors were a contributing factor in 1534 incidents. Fatigue is often under-cited in NTSB helicopter investigations because of a lack of available quantitative information related to fatigue. Based on benchmarks from other industries, fatigue is a factor in 1 in 5 of all incidents. If we assume that number holds true for helicopter operations, that means that the true number of fatigue-related helicopter accidents since 1990 would be several times higher than the 28 reported.</p> <p>It is well known that fatigue-related deficits accumulate relative to factors such as long days, sleep debt, and night work. But how much fatigue is too much? Most rotorcraft operators have policies that enable crew members to take themselves out of duty if they feel too fatigued to safely perform their duties. This approach relies on crewmembers' subjective self-assessment of their own level of fatigue-related deficits. This is problematic because research studies have shown that:</p> <ul style="list-style-type: none"> <li>• When we have sleep debt, we systematically underestimate the degree of our own alertness deficits.</li> <li>• When we are fatigued, our perception about risk changes, and we are willing to accept more risk.</li> <li>• Thresholds related to how much fatigue risk is acceptable will vary from person-to-person and may be biased by external factors related to production goals.</li> </ul> <p>What is needed is a comprehensive approach to fatigue risk management that:</p> <ul style="list-style-type: none"> <li>• covers all sources of fatigue risk</li> <li>• is based on a quantitative objective framework</li> </ul>

	<ul style="list-style-type: none"> <li>• has clear thresholds to identify elevated fatigue risk conditions</li> <li>• has pre-defined workflows to mitigate fatigue risk</li> <li>• tracks the effectiveness of the whole fatigue risk management process</li> </ul> <p>In this project, the USHST will develop guidance material for operators to establish a Fatigue Risk Management Program based on a quantitative objective framework to identify scenarios associated with elevated fatigue risk and to aid in the consistent and reliable execution of effective risk controls. Guidance material will take the form of a white paper to educate operators about the need for an FRMP; a GAP analysis tool to evaluate FRMP maturity; and a how-to guide to establish an FRMP.</p> <p><b>Project:</b> USHST Fatigue Risk Management Working Group will:</p> <ol style="list-style-type: none"> <li>1. Conduct research and publish a white paper that communicates the need for an FRMP among rotorcraft operators. This will include a review of helicopter incidents investigated by NTSB.</li> <li>2. Develop a GAP analysis tool to support rotorcraft operators in evaluating the maturity of their current fatigue risk management practices and set goals to establish a comprehensive FRMP to cover the range of fatigue risks in their operations.</li> <li>3. Develop a how-to guide for rotorcraft operators to aid in setting up an effective FRMP.</li> </ol>
<p><b>Relation to Current Aviation Community Initiatives:</b></p>	<p>To be completed [DM to confirm efforts by Dr. Avers at FAA]</p>

<b>Key Milestones:</b>	<b>USHST Project Plan</b>												
		Month: 1 2 3 4 5 6 7 8 9 10 11 12											
	<b>Conduct research and publish a white paper that communicates the need for an FRMP among rotorcraft operators. This will include a review of helicopter incidents investigated by NTSB</b>												
	Complete review of current guidance												
	FSF BARS												
	CAMTS												
	FAA Part 134 ARC report												
	FAA accidents related to fatigue management												
	Draft white paper												
	Coordinate with industry stakeholders to publish white paper												
	<a href="#">Milestone 1: White Paper Published</a>												
	<b>Develop a framework and how-to guide for rotorcraft operators to aid in setting up an effective FRMP</b>												
Develop FRMP framework													
Develop how-to guide													
Coordinate with stakeholders to publish how-to guide													
<a href="#">Milestone 2: FRMP How-To Guide Published</a>													
<b>Develop a GAP analysis tool to support rotorcraft operators in evaluating the maturity of their current fatigue risk management practices and set goals to establish a comprehensive FRMP to cover the range of fatigue risks in their operations</b>													
Develop GAP analysis concept													
Implement HTMP GAP analysis tool													
<a href="#">Milestone 3: GAP Analysis Tool in Production</a>													
<b>CICTT Code:</b>													
<b>Output 1:</b>													
<b>Description:</b>	Conduct research and publish a white paper that communicates the need for an FRMP among rotorcraft operators. This will include a review of helicopter incidents investigated by NTSB.												
<b>Lead Organization:</b>	Pulsar Informatics												
<b>Supporting Organizations:</b>	TBD												
<b>Actions:</b>	<ol style="list-style-type: none"> <li>1. Complete review of current guidance: <ul style="list-style-type: none"> <li>○ FSF BARS</li> <li>○ CAMTS</li> </ul> </li> </ol>												

	<ul style="list-style-type: none"> <li>○ FAA Part 135 ARC report</li> <li>○ FAA accidents related to fatigue management</li> </ul> <ol style="list-style-type: none"> <li>2. Draft white paper</li> <li>3. Coordinate with industry stakeholders to publish white paper</li> </ol>
<b>Target Completion Date:</b>	06/01/2024
<b>Output 2:</b>	
<b>Description:</b>	Develop a framework and how-to guide for rotorcraft operators to aid in setting up an effective FRMP
<b>Lead Organization:</b>	Pulsar Informatics
<b>Supporting Organizations:</b>	TBD
<b>Actions:</b>	<ol style="list-style-type: none"> <li>1. Develop FRMP framework</li> <li>2. Develop how-to guide</li> <li>3. Coordinate with stakeholders to publish how-to guide</li> </ol>
<b>Target Completion Date</b>	09/01/2024
<b>Output 3:</b>	
<b>Description:</b>	Develop a GAP analysis tool to support rotorcraft operators in evaluating the maturity of their current fatigue risk management practices and set goals to establish a comprehensive FRMP to cover the range of fatigue risks in their operations
<b>Lead Organization:</b>	Pulsar Informatics
<b>Supporting Organizations:</b>	TBD
<b>Actions:</b>	<ol style="list-style-type: none"> <li>1. Develop GAP analysis concept</li> <li>2. Implement HTML GAP analysis tool</li> </ol>
<b>Target Completion Date</b>	09/01/2024