

Topic: N171-026

Wolf Technical Services, Inc.

Aircrew-Mounted Self-Adjusting Tether System

Wolf's compact self-adjusting tether system technology significantly enhances aircrew safety and mobility over existing/legacy tether systems. Wolf's system automatically manages tether slack and locks tether payout during high-speed events – increasing fall protection as well as crashworthy protection for mobile aircrew in the event of a survivable aircraft mishap. Initial targeted platforms include tiltrotor and rotary wing platforms in any service branch. Compatible with the CMU-37, Aircrew Endurance Vest (AEV), Wolf's system increases aircrew safety and mobility while allowing for connection to existing airframe attachment points – eliminating the need for aircraft modifications. Prototype testing has demonstrated/verified key system functionalities. The end objective is to manufacture and sell this product in conjunction with a contract manufacturer for use in tiltrotor/rotary wing platforms.

Technology Category Alignment:

Rotary Wing Vehicles

Protection, Sustainment, and Warfighter Performance

**Contact:**

Amy Wortman

[awortman@wolftechnical.com](mailto:awortman@wolftechnical.com)

(317) 842-6075

<http://www.wolftechnical.com>

**SYSCOM:** NAVAIR

**Contract:** N68335-19-C-0041

**Booth:** 405

**Room:** FST at AIAA Aviation 2020

**WHO**

**SYSCOM:** NAVAIR

**Sponsoring Program:** V-22 Joint Program Office (PMA 275)

**Transition Target:** V-22

**TPOC:**  
(301)342-3988

**Other transition opportunities:**  
Tiltrotor and rotary-wing platforms in any service branch.

**Notes:** Gunner on tail ramp of V-22 platform using the existing, manually-adjustable tether system.



Photo courtesy of the U.S. Marine Corps, 160211-M-QO006-004.JPG

**WHAT**

**Operational Need and Improvement:** Currently, mobile aircrew who serve in rotary wing platforms rely on a manually-adjustable tether connected to the Aircrew Endurance Vest (AEV) or the Gunners Belt for their primary restraint system while not seated. The manually-adjustable tether on both the AEV and Gunners Belt rely on the user to continually monitor tether length and adjust appropriately throughout a mission in order to provide occupant retention. An improved, self-adjusting tether system is needed that can provide enhanced protection in both fall and crash scenarios.

**Specifications Required:** The system shall attach to existing tether attachment points and automatically adjust webbing payout and retraction. The system shall weigh less than 3 pounds and withstand a static load of 5000 pounds for a minimum of 3 seconds. It shall provide fall and crash protection while allowing the aircrew to move freely without inadvertent lock or release while performing typical mission duties.

**Technology Developed:** Wolf Technical Services has developed a self-adjusting tether system that provides a secure aircraft attachment while automatically managing webbing slack for aircrew. This system maintains a compact profile and weight while providing the required holding strength to protect the user. Safety features are incorporated to further protect the user during fall and crash situations by automatically locking and preventing further movement away from the attachment point. Final tether length can be set by the user to prevent accidental exit from the aircraft while performing mission duties. The system serves as a direct replacement for manually-adjustable tethers that are currently used by connecting to the same aircraft interface locations.

**Warfighter Value:** This system provides improved protection for mobile aircrew over existing technology. Unlike previous self-adjusting tether technology, this system can serve as a direct replacement for manually-adjustable tether systems and requires no aircraft modification for implementation. The system design maintains a compact package which allows freedom of movement for the aircrew without the build-up of tether slack that can pose a risk to the user. Safety features help to protect the aircrew during fall and crash situations and avoids inadvertent locking while performing typical maneuvers throughout a mission.

**WHEN**

**Contract Number:** N68335-19-C-0041 **Ending on:** December 6, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Concept prototype fabrication and subsystem-level testing	N/A	Passed subsystem-level testing of major safety functions	4	August 2018
Conduct user evaluations of full-featured prototype	Low	Collect and incorporate user-feedback regarding system functionality and integration	5	December 2019
Full-featured prototype system testing	Med	Pass development performance and environmental tests driven by system specification	6	June 2021

**HOW**

**Projected Business Model:** Our model is to manufacture and sell the self-adjusting tether system directly to the Government in conjunction with our manufacturing contract partner who currently manufactures military products.

**Company Objectives:** The near-term objective is to obtain additional program sponsors to secure a follow-on Phase III contract to finish device qualification testing and production preparation efforts. Our contract manufacturing partner will be involved throughout the development process to address manufacturing readiness issues of the product. Wolf Technical Services will contract production efforts to the manufacturing partner and directly sell products to the end customer. Service and support of produced equipment will also be handled by the contract manufacturing partner in conjunction with Wolf Technical Services' technical knowledge of the product.

**Potential Commercial Applications:** The self-adjusting tether system provides improved safety and functionality over the existing, manually-adjustable tether system. This system can serve as a direct replacement for the existing system and has potential to be used in various air platforms utilizing the current technology. Outside of the Navy, this system is applicable for use in air platforms across multiple defense service branches as well as other government agencies such as law enforcement agencies. In the commercial sector, mobile aircrew in commercial aviation and medical evacuation services are also potential customers of this product. Outside of aviation applications, this system can also be utilized as a fall protection device for industrial applications such as construction and maintenance.