

Department of the Navy SBIR/STTR Transition Program

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

NAVAIR 2021-849

Topic # N171-026

Aircrew-Mounted Self-Adjusting Tether System

SAFE, Inc.

WHO

SYSCOM: NAVAIR

Sponsoring Program: Naval Air Warfare Center Aircraft Division, Crashworthy and Escape Systems Branch

Transition Target: MV-22B

TPOC:
(301)342-3988

Other transition opportunities: CH-53K, MH-60S, UH-1Y, C-130

Notes: Image depicts a developmental prototype. Feedback from a recent user evaluation with VMX-1 at Yuma MCAS resulted in a modification to the AEV integration that will place the fairlead on the bottom of the system to simplify the system connection to aircraft floor-mounted tiedown rings. Production system will be color matched to the AEV.



Images courtesy of Safe, Inc.

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 when not seated. A self-adjusting system mounted on the aircrew would allow for improved user control and functionality, increased fall protection, and enhanced safety during a potentially survivable aircraft mishap.

Specifications Required: The system must successfully restrain a mission-equipped 95th percentile male user under a 12-14g dynamic load and a drop height equal to the tether cord length. It must sustain a 5000-pound force load for a minimum of 3 seconds and a tether cord tensile strength over 8000 pounds. The system must provide automatic or manual adjustment of the tether cord slack throughout its range and allow the user to freely move about the aircraft cabin without concern for inadvertent release or twisting. The system must integrate with the CMU-37 AEV and its quick release mechanism. The system must not require modification to the aircraft or use aircraft power.

Technology Developed: The Aircrew-Mounted, Self-Adjusting Tether Systems (AMSATS) is a lightweight, self-retracting aircrew tether system with the operational controls and retraction spool mounted on the AEV providing increased mobility and safety while moving about the aircraft cabin. Innovative features include manual locking controls with auto-locking, auto-retraction, and emergency lock functionality.

Warfighter Value: This technology provides significantly improved fall and crashworthy protection to rotary wing aircrew who must move about the aircraft cabin while the aircraft is in flight.

WHEN

Contract Number: N68335-19-C-0040 **Ending on:** June 1, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Phase I - Base	Low	Completed design prototype; fabricated critical structural components and completed static tests; fabricated and evaluated basic user controls	3	November 2017
Phase I - Option 1	Low	Testing, evaluation, and selection of cord material including splicing techniques	4	September 2018
Phase II - Base	Low	Fabricated functional rapid prototype & conducted initial user evaluation; Updated design & user controls; fabricated revised prototype & conducted second user eval; Completed cord fatigue testing & confirmed final cord selection; Vest integration	5	December 2019
Phase II - Option 1	Low	Updated system design based on user feedback; Conducted weight optimization; Completed vest integration including use of emergency release; Conducted third user evaluation	6	June 2021
Phase II - Option 2	Low	Refine operational features and vest integration based on user feedback; Conduct static and dynamic tests; System qualification	8	June 2022

HOW

Projected Business Model: Our business model is to design, develop, qualify, produce, and provide innovative safety systems to government and commercial customers.

Company Objectives: We anticipate the Navy SBIR/STTR Transition Program (STP) Forum will provide additional program information, interested stakeholders and contacts, guidance and recommendations that will allow us to successfully transition the Advanced Aircrew-Mounted, Self-Adjusting Tether System (AAMSATS) from development into production and full integration into the Department of Defense aviation enterprise to contribute to improve the safety and mission effectiveness of our aircrews.

Potential Commercial Applications: This technology is appropriate in additional applications where a user controlled tether-type restraint is required such as high-rise construction, bridge and building maintenance, or tower services.

Contact: Jim Schroeder, Director of Business Development
jim.schroeder@safeinc.us (720) 256-1030