

Topic: N171-018

## TRITON SYSTEMS, INC.

### Low Cost In-Flight Bladder Relief

Current mission profiles and ability for mid-air refueling have extended flight times for military aircrew. Triton's new bladder relief system provides a low-cost, disposable human interfacing component that fully integrates with all aircrew equipment and Aircrew Life Support Systems (ALSS). This will allow aircrew to avoid the challenge of relieving themselves in flight, remain fully hydrated, and maintain peak cognitive and physical performance as well as situational awareness. Our system is designed for both female and male aviators, has gone through several rounds of prototyping, and its functionality has been verified. Triton Systems, Inc. develops advanced human systems technologies for commercial, industrial, and Government use. Our goal is to integrate and transition this technology into government and commercial markets by licensing our Intellectual Property to manufacturing partners.

### Technology Category Alignment:

Personalized Assessment, Education, and Training

Protection, Sustainment, and Warfighter Performance

### Contact:

Kim Hallett

[khallett@tritonsys.com](mailto:khallett@tritonsys.com)

(603) 833-1564

<http://tritonsys.com/>

**SYSCOM:** NAVAIR

**Contract:** N68335-19-C-0003

**Booth:** 405

**Room:** FST at AIAA Aviation 2020

# Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2019-842

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Low Cost In-Flight Bladder Relief  
TRITON SYSTEMS, INC.

## WHO

**SYSCOM:** NAVAIR

**Sponsoring Program:** PMA-202, Aircrew Systems

**Transition Target:** Fixed-wing and Rotary-wing aircrew

**TPOC:**  
(610)746-3599

**Other transition opportunities:**  
All high performance fighter aircraft aircrew as well as rotary wing aircraft aircrew who could benefit from our affordable In-Flight Bladder Relief technology.



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**Notes:** Image depicts Triton's low cost in-flight bladder relief Gen 2.1 prototype system. Aircrew are able to dispose of low cost wetted components after every flight. Meanwhile, our non-disposable, maintenance-free extraction unit stays completely dry and clean.

## WHAT

### Operational Need and Improvement:

Develop a low cost solution that provides female and male aircrew bladder relief during flight.

### Specifications Required:

To be most effective for aircrew in-flight use, the system must provide the following capabilities:

- Cost less than \$50 per flight
- Provide bladder relief for both male and female aircrew with flow rate of 1.5L per minute
- Collect 800cc per use, not restrict movement of aircrew at any time, hands-free urine collection
- Compatible with all aircraft ejection seats, does not weigh more than 1lb
- Operate in an aircraft environment in conjunction with flight uniform, anti-G suit while restrained
- Compatible with Life Support Systems flight gear and be discreet in appearance when worn
- Device should have no special disposal requirements
- Next to skin component should not be reusable

### Technology Developed:

Triton Systems has developed a low-cost bladder relief system that meets Navy requirements:

- Compatible for female and male aircrew
- All human interfacing components are low cost, reliable, comfortable, ergonomic, and disposable
- Our solution is a "no-clean," sanitary system that does not require cleaning or maintenance

### Warfighter Value:

- Easy to use w/o interfering with in-flight operations
- Eliminates need for "tactical" dehydration
- Improves physical, cognitive performance and situational awareness
- Reduces distraction of a "full bladder"
- Eliminates need to remove restraint systems and life support equipment
- Cost less than \$50 per flight

## WHEN

**Contract Number:** N68335-19-C-0003

| Milestone                                      | Risk Level | Measure of Success  | Ending TRL | Date           |
|--|------------|---|------------|----------------|
| Functional Prototype Demonstration with NAVAIR | Med        | Demonstrate satisfactory functionality of human interface and extraction system with Navy aircrew   | 5          | November 2019  |
| Aircrew Ground Testing                         | Med        | End user verification of system requirements such as comfort, reliability, nonrestrictive integration with aircrew equipment, compatibility with Life Support Systems, etc. | 5          | September 2020 |
| System Verification and Validation Testing     | Med        | Candidate prototype system passes qualification testing, i.e., system performance, reliability, and environmental resistance  | 5          | January 2021   |
| Aircrew In-Flight Testing                      | Med        | End user verification of full system requirements while in-flight   | 6          | September 2021 |
| Certification for Safe-to-Fly                  | Med        | Candidate system passes NAVAIR qualifications to be considered safe to use in flight on both fixed-wing and rotary-wing aircraft  | 7          | December 2021  |

## HOW

### Projected Business Model:

Triton's plan is to integrate and transition this technology into government and commercial markets by licensing our Intellectual Property to manufacturing partners.

### Company Objectives:

Triton Systems, Inc. develops advanced human systems technologies for commercial, industrial, and Government use. Through our participation in the SBIR/STTR Transition Program (STP) we hope to further our connections with Government and industry decision-makers invested in bringing superior relief options to their constituents. In the short-term, Triton's objective is to bring to market a solution designed to integrate with the aircraft environment. Our Longer-term objective includes design modifications to provide a superior low-cost, portable, disposable urinary relief device in a variety of applications.

### Potential Commercial Applications:

Our technology will find many applications in other communities. This includes a broad range of mission critical department of defense systems such as transport outside of aircraft (e.g., tank operators) and hazardous environments. Additional civilian applications include commercial transportation, first responders, chem/bio/clean labs, and medical.

**Contact:** Kim Hallett, Principle Investigator  
[khallett@tritonsys.com](mailto:khallett@tritonsys.com) (603) 833-1564