

# FY23 Maritime Capable Tethered Unmanned Aerial Systems (UAS) Assessment Criteria

## Maritime Tethered Unmanned Aerial Systems (UAS) SOF AT&L PEO SR

**Problem Statement:** SOF require a small tethered UAS that can operate in both land and saltwater maritime environments for intelligence gathering and surveillance. It should be capable of operating in a static or moving configuration while performing both force protection and intelligence gathering functions. The tethered UAS should provide a basic full motion video capability, but also be adaptable to carry a variety of payloads.

**Intended Operational Use:** SOF will use maritime capable (saltwater infused air environment to include salt fog or saltwater splash) tethered UAS to achieve persistent surveillance/situational awareness for force protection/traditional security, pattern of life monitoring, video capture of sizable outdoor events and the ability to carry payloads for surveillance/situational awareness. Additionally, it will accomplish intelligence, surveillance and reconnaissance mission using onboard or installed sensors. Lastly, it will provision emergency telecommunications networks.

**General Operational Conditions:** Tethered UAS must be capable of operating in a maritime environment. The demonstration will take place in a variety of outdoor environments to include forest, desert, marsh, fields, coastal, or urban terrain. The system must operate in both day and night ambient light conditions. System should be designed and built for safe failure as much as possible, accounting for specific hazards of maritime operations. It should be capable of operating safely when exposed to lightning. Further, it must operate in adverse weather conditions to include gusty wind, rain, sleet, and light snow. System may utilize GPS signals or any other available navigation techniques for fail-safe flight mechanisms during testing. Resilience when experiencing GPS interference or jamming is highly desirable. UAS should provide for hasty launch and recovery. Signature reduction techniques should be employed as much as possible to reduce detectability of SOF. System should provide for autonomy and workload reduction features to enable limited operational personnel to perform other aspects of the mission.

**Flight Demonstration Conditions:** Vendor will bring and operate a production ready, off-the-shelf system to a coastal daytime environment. A mock deck space will be provided, not to exceed 12 ft x 8 ft, which must support all launch, recovery, and ground control equipment. Aircraft will be operated from a static ground location, or, upon request, a trailer can be provided to demonstrate moving capability. Collection target and goals will be provided in advance of testing to accomplish desired mission scenario. The demonstrator will be provided a boundary to secure and/or a target to collect from the hovering location. The tethered UAS will launch and collect information on target using payload sensors available from the vendor. The mock deck space will be placed on a towable trailer if movement is to be observed. The specifically observed attributes from the demo is attached with column labeled "Must Demo".

### Salient Characteristics and Performance Attributes for System After Adaptations:

- Ability to operate on land and from a small maritime craft in saltwater environment
- Ability to launch and recover from a moving platform up to 20mph
- Ability to launch, operate, and recover from deck space not to exceed 12ft x 8 ft
- 24-hours of continuous operations
- Controlled operating altitude from launch to at least 400ft
- Communication and controls: Flexible & strong conduit (tether) providing power, communication, control, and payload data without any external RF transmission.

- High-rate data from payloads is expected, with preference to isolate from tether aircraft control signal in order to expedite approval to operate
- High-rate data (up to 40 Gbps) will be secured/protected with minimal unintended radiation and maximum resistance to electronic warfare
- Maintainable: Single operator use. Ability to sustain flight autonomously, allowing operator to focus on payload operations. Ground control system (GCS) should be simple and easy to use
- Transportable: Weight not to exceed 40 lbs. (without payload)
- Safe operations in sustained winds of 25 and gusts to 35
- System should be capable of running on ship power for maritime operations and generator or vehicle power for land operations
- Automated tether winding with robust tensioner
- GPS denied precision launch, station keeping and landing during day and night operations
- Smart Power Management/System Monitoring: multi-copter with rotor drive motors, control electronics and payloads
- Reduced UAS signature: Features are desired to reduce radar cross-section, passive RF, infrared and acoustic signatures
- Safety features: Strong physical connection, backup power source for aircraft, arresters to improve protection from voltage transient caused by lightning or accidental contact with AC power lines and automatic power cut off in the event the tether is separated
- Payload: Ability to carry and remotely operate a variety of IR and HD cameras for real-time video streaming, radio communications or data relay/repeaters, environmental sensors and other ISR sensors up to 10 lbs. on land (generator) and 7 lbs. on a maritime craft (ship power ~3000 watts).
- Open architecture
- Ability to implement modular payload receiver (<https://apps.dtic.mil/sti/citations/AD1167779>) into existing design with an additional B kit attaching to the base station