WATERHOUND INC. – AEROSPACE SOLUTIONS DIVISION

1483 W Broad St, Columbus, OH 43222

PROPOSAL RESPONSE TO:

REQUEST FOR PROPOSAL (RFP)

Autonomous Aerial Vehicle for Open Sea Search and Rescue Operations

Department of the Ocean Force (DOF)

RFP DOF/AAV/2023-24

August 28, 2023

INTRODUCTION

Waterhound Inc., Aerospace Solutions Division, is pleased to respond to the Department of the Ocean Force (DOF) RFP for the development of an Autonomous Aerial Vehicle (AAV) for Open Sea Search and Rescue Operations. Leveraging our extensive experience in high-altitude, long-duration Combat Search and Rescue (CSAR) aircraft, we propose the Despoina and Arion Autonomous System (DAAS). This innovative twin-drone solution combines our expertise in CSAR aircraft with the latest advancements in drone technology, offering an optimal balance between loitering time, coverage area, survivability, detection rates, and cost-effectiveness.

TECHNICAL APPROACH

1. System Loitering Time:

Waterhound's significant experience with high-altitude, long duration CSAR aircraft has equipped us with the knowledge and expertise to develop a drone system with exceptional loitering time. The proposed Despoina-Arion twin drone system will utilize advanced battery technology, and aerodynamic design to ensure extended periods of operation. While loitering, our drones will be able to efficiently gather data and perform surveillance, further enhancing the rescue operation's overall effectiveness.

2. System Speeds and Search Swath:

The Despoina-Arion twin drone system is designed to cover a large search swath at considerable speeds, ensuring quick, efficient coverage of the area of interest. The twin-drone approach ensures wide-area coverage in less time, without compromising the quality or resolution of the data collected. Utilizing cutting-edge propulsion systems, our drones will provide the needed speed for prompt arrival at the

scene, combined with the ability to slow down for detailed surveillance when a potential target is detected.

3. Survivability:

With Waterhound's history in CSAR aircraft, we understand the importance of survivability in harsh environments. Our drones will be robust and resilient, capable of withstanding high wind speeds, extreme temperatures, and corrosive sea air. Each drone will be equipped with an advanced weather prediction system, allowing them to anticipate and avoid potentially hazardous conditions to ensure mission continuity.

4. High Confidence Detection Rates:

Our drones will leverage state-of-the-art EO/IR sensors, paired with advanced pattern recognition and machine learning algorithms to achieve high confidence detection rates. The cross-communication capability will allow the drones to corroborate and confirm detections, reducing the chances of false positives and ensuring accurate identification of DOF members in the open sea.

5. Past Performance:

Waterhound Inc. has a strong track record in delivering high-quality aerospace solutions to numerous defense departments worldwide. Our successful implementation of high-altitude, long-duration CSAR aircraft demonstrates our capability to innovate and deliver on complex projects. Although we have less experience in drone design, our aerospace solutions division is competent and ready to transition our extensive knowledge to this new platform.

6. Program Management Structure:

We employ an agile, risk-based project management approach that fosters continuous improvement and promotes accountability. Our program management structure includes routine status reviews, key milestone tracking, and risk mitigation strategies. This ensures that we consistently deliver on time and within budget, while maintaining the flexibility to adapt to changing project needs or circumstances.

7. Multi-module Sensors:

The Despoina-Arion system will incorporate a suite of multi-module sensors, including EO/IR payloads, Synthetic Aperture Radar (SAR), and Lidar. This will provide the drones with unparalleled surveillance and detection capabilities in diverse conditions. Furthermore, each sensor module will be upgradeable and interchangeable, providing flexibility and adaptability for future operational requirements.

8. System Deployment Agility:

Quick response is vital in any rescue operation. Our drones will be designed for rapid deployment, with autonomous launch and recovery systems to ensure swift action. Our proprietary AI navigation systems allow the drones to adapt in real-time to dynamic environmental conditions, optimizing flight paths for speed, efficiency, and safety.

9. Safety Measures:

Safety is paramount in all Waterhound operations. The Despoina-Arion drones will incorporate multiple redundancies in critical systems to ensure safe operation even in the event of system failures. Additionally, the drones will have fail-safe mechanisms like automated return-home features in the event of critical faults or loss of communication.

10. Autonomous Navigation:

Our drones will be equipped with advanced AI systems to enable fully autonomous navigation in challenging sea conditions and poor visibility. These AI systems, developed in-house, allow the drones to process data in real-time, make decisions autonomously, and adapt to changing environmental conditions.

11. Detection and Identification Capabilities:

Using our advanced EO/IR sensors and AI-powered algorithms, our drones will possess superior detection and identification capabilities. The twin-drone design will allow for corroborative detection, reducing false positives and increasing overall confidence in target identification.

12. Scalability:

The Despoina-Arion system is designed with scalability in mind. The twin-drone concept can easily be expanded to a multi-drone system, providing increased coverage and faster search times. Additionally, our modular sensor design allows for the integration of new sensor technology as it becomes available, ensuring the system remains at the forefront of search and rescue technology.

13. Post-mission Analysis Capabilities:

Data captured during each operation will be stored and made available for post-mission analysis. Our advanced data analysis software can provide insights into patterns and trends, improving future rescue operations. Furthermore, the Despoina-Arion system's data stitching capability will ensure a complete and comprehensive understanding of each mission.

Additionally, Waterhound is currently developing an advanced hyperspectral imaging sensor, not in the scope of the current proposal. When completed, this sensor could be incorporated into the Despoina-Arion system to provide an even higher level of detection and identification capability, particularly useful for distinguishing different materials or substances in the oceanic environment. Although this is not included in the current proposal, we believe it is a worthy future consideration for enhancing the effectiveness of the system.

PROGRAM MANAGEMENT STRUCTURE

Our dedicated program management team will leverage Waterhound's robust project management methodologies, ensuring effective communication, risk management, and adherence to timelines and budget.

COST PROPOSAL

Our estimated cost for the initial prototyping phase is $8,500,000, which covers the design, development, testing, and refinement of the DAAS. This also includes labor costs, acquisition of raw materials, and utilization of state-of-the-art tools and technologies required for the development of an advanced drone system. Upon successful completion of the prototype, we anticipate a cost of $800,000 per unit for the production phase. This includes manufacturing, assembly, and final testing, as well as the cost of integrating our advanced sensor suite and communication systems. While this might seem substantial, we assure that the investment will yield a highly reliable, effective, and future-proof search and rescue drone system that offers a long service life and high operational value.

PAST PERFORMANCE

Waterhound Inc. has an extensive background and successful track record in aerospace technology, with particular expertise in the field of high-altitude, long-duration CSAR aircraft. Our innovations and developments have led to significant improvements in flight duration, communication systems, and surveillance technology. We have worked with numerous defense departments globally, always delivering solutions that exceed expectations. However, it's essential to consider that while our experience with aerospace technologies is extensive, our foray into drone technology is relatively new. Although our team is knowledgeable and skilled, the shift from manned to unmanned systems presents a learning curve that could potentially increase the risk. However, we are confident in our ability to navigate these challenges and apply our extensive knowledge of aerospace technologies to the development of advanced drone systems.

QUALITY ASSURANCE

At Waterhound Inc., we are committed to delivering quality solutions. Our comprehensive Quality Assurance (QA) plan is an integral part of our project lifecycle, ensuring the high quality and performance of our products. Our QA plan incorporates multiple stages of rigorous testing, validation,

and refinement. In the development phase, each design will be assessed and validated against set criteria. During the production phase, every component and system will undergo exhaustive testing to ensure they meet our high-performance standards. Moreover, we believe in a feedback-driven approach. We incorporate feedback from all stages into our design and production processes, allowing us to continuously improve our products and ensure we are meeting the needs of our clients.

LEGAL AND CONTRACTING DETAILS

Waterhound Inc. understands and commits to fulfilling all legal and contractual obligations outlined in the RFP. We respect and adhere to regulations regarding safety, confidentiality, intellectual property rights, and fair trade practices. We will provide detailed documentation and certifications as required. However, we wish to highlight that, given the proprietary nature of our design and development processes, we assert ownership and control over the methodology related to the DAAS. Despite any other agreements or stipulations, we will maintain control over our intellectual property rights, granting the DOF a non-exclusive, royalty-free, worldwide license for governmental purposes. This license includes the use, modification, reproduction, release, display, and disclosure of such data and intellectual property.

COMPLIANCE WITH REGULATIONS AND STANDARDS

Waterhound Inc. ensures full compliance with all relevant federal, state, and local regulations and standards, including FAA Regulations, Autonomous Vehicle Standards, and Environmental Protection and Safety Standards.

CONCLUSION

We look forward to the opportunity to provide the DOF with an innovative, cost-effective solution for open sea search and rescue operations. Waterhound Inc. is committed to ensuring the successful execution of this project and enhancing the DOF's operational capabilities.

Sincerely,

[Your Name]

[Your Position]

Waterhound Inc. – Aerospace Solutions Division

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