OBJECTIVE: Volatilities in global weather and geo-political climate are increasing the frequency and magnitude of natural and manmade disasters. Providing rapid response to affected areas is critical to saving lives, as the immediate aftermath of a disaster presents the greatest risks to survivors and to first responders. The highly dynamic environments resulting from debris and infrastructure destruction creates a significant challenge in moving supplies into and survivors out of disaster zones. The Navy and Marine Corps seek to develop and demonstrate rapid, distributed, on-demand manufacturing of unmanned systems capable of supporting multiple payloads dependent on the situation.

DESCRIPTION: The Department of the Navy (DON) seeks to develop and demonstrate rapid, distributed, on-demand, small-scaled, domestic manufacturing of unmanned systems capable of supporting multiple payloads depended on the situation. DON intends to collaborate with innovative small businesses for technologies and methods related to the following Focus Areas:

1. Agile manufacturing on-demand solutions for Unmanned Systems (UxS) products
2. Control systems for unmanned platforms to include either Group 1 – Unmanned Aircraft Systems (UAS) or conversion of manned watercrafts into Unmanned Surface Vehicles (USV)
3. Notional payload concepts based on using commercial-off-the-shelf (COTS) technologies

1. Agile manufacturing on-demand solutions for UxS products: define and develop customizable systems with the ability to fabricate close to the point-of-need. This includes access to manufacturing of components and assemblies across multiple facilities to accommodate surge requirements. This includes supply chain authentication and management required for the rapid local UxS assembly.
2. Control systems for unmanned platforms to include either Group 1 – UAS or USV: develop reconfigurable control systems demonstrating the ability for self-swarming organization and redistribution, fratricide-collision avoidance, and waypoint-based navigation. These systems must be rapidly tailorable to enable the conversion and use of any available assets as UxS under emergency conditions.
3. Notional payload concepts based on using COTS technologies: demonstrate capability for rapid acquisition and configuration for modular payloads to enable rapid response in Humanitarian Assistance and Disaster Relief (HADR) operations. Needed capabilities include communication, improved situational awareness, supply delivery, and victim extraction.

PHASE I: Please add the primary Focus Area number you are proposing to as a prefix to the Phase I Proposal title. Proposers will develop and demonstrate an initial functional prototype meeting at least one primary Focus Area of the three Focus Areas listed under this topic. However, a proposer may choose to include secondary Focus Area(s) within the proposal submission. Technical proposals are limited to 5-pages and must provide sufficient information to allow assessment that the initial prototype demonstrated at the end of Phase I will function in a relevant environment in a manner meeting the specified capability. This information may include, but is not limited to, detailed designs, component and system laboratory testing, or a minimum viable product (MVP) [Ref. 1]. Ideally, the Technology Readiness Level (TRL) [Ref. 2] at the start of Phase I will be TRL 4-5 with the functional prototype at or near TRL 6 at Phase I completion. At the end of Phase I, the initial functional prototype will be demonstrated, a detailed report on prototyping test results, and detailed plans for the small-scaled manufacturing of the prototypes will be provided to the Government. Proposals must include a discussion of the dual-use defense and commercial market opportunities for the technology being proposed, including a preliminary assessment of commercial market potential. Phase I period of performance shall not exceed 4 months, and the total fixed price shall not exceed $200K.

PHASE II: During Phase II, the functional prototype from Phase I can be further developed and refined into an operational prototype based on defense and commercial customer feedback. Phase II will consist of three Rounds of funding with progression between
phases: Phase I, Phase II, and Phase III. Each phase is designed to progressively develop and demonstrate the technology's viability and potential for operational and commercial success. The Federal Government will fund the development of these capabilities through the Small Business Innovation Research (SBIR) program.

**PHASE I: DEMONSTRATION OF VIABILITY**

Phase I is the initial phase of the program, focused on the demonstration of viability. The proposer will develop an initial prototype that meets the needs of DON users and systems integrators. The prototype should be capable of demonstrating key performance parameters, such as endurance, payload capacity, and communication range, among others. The proposed testing protocols will be designed to ensure that the developer is evaluating the technology in the operational environment. The Federal Government will fund Phase I to a maximum of $500,000, with a period of performance not to exceed 6 months.

**PHASE II: PILOT TESTING IN AN OPERATIONAL ENVIRONMENT**

Phase II builds on the foundation established during Phase I, with the goal of conducting pilot tests in an operational environment. The proposer will be expected to produce no less than 100 units of the prototypes considered for Phase II. These tests will be conducted using DON personnel in real operational environments and scenarios. The Federal Government will fund Phase II to a maximum of $1,000,000, with a period of performance not to exceed 6 months. The Phase II agreement will include provisions for funding the necessary SBIR or non-SBIR Government funds to ensure support and proper proficiency of the solution is in place prior to completion of the effort.

**PHASE III: DUAL-USE APPLICATIONS**

Phase III is intended for additional operational testing, if required, using multiple prototypes and users simultaneously in a DON operational environment. This Round may require delivery of no less than 1,000 prototypes and/or licenses of the technology for testing purposes. If non-government personnel are utilized as part of the testing, appropriate Non-Disclosure Agreements will be obtained to protect against disclosure of the proposer’s intellectual property (if properly marked). The proposer may be required to support the conduct of the tests, but the operation of the prototypes in the test must be capable of being performed by the Government. SBIR funding, if available for Round III, will require non-SBIR Government or private funds included as a 1:1 Cost-Match, with SBIR funds not to exceed $1,500,000 under the 1:1 Cost-Match. The required number of end users and prototypes as well as the operational scenarios to be run are not yet defined. Therefore, this Round is currently undefined.

Finally, the Federal Government sees the development of these capabilities as benefiting industrial maintenance activities in partnership with the Navy. The ability to keep critical assets in operation is a common need for which the Navy is seeking willing partners.

REFERENCES:

3. Information on Business Accelerator Pilot opportunity with H4Xlabs for ADAPT Phase I Awardees (defined in Business Accelerator Services section in Proposal Submission Instructions for ADAPT Topics): [h4xlabs.com/sbir](h4xlabs.com/sbir)

KEYWORDS: Unmanned Systems; UxS; Unmanned Aircraft Systems; UAS; Unmanned Surface Vehicles; USV; Humanitarian Assistance and Disaster Relief; HADR