

DPA26BZ05-DV021

Open Architecture Platform for Underwater Vehicles for Rapid Adaptation, Collaborative Sensing, Navigation, and Autonomy| Frequently Asked Questions (FAQs)

1. What vehicle size, mass, speed, depth range, endurance, and two-person-portability limits are hard requirements for the Phase II AUV?

A: We do not specify exact vehicle size, mass, speed, depth range, and endurance requirement. The only explicitly stated metrics are for the AUV to be two-person portable, able to support operations up to 24 hrs and able to achieve fixed-depth station-keeping.

2. What flooded-hull/modular mechanical architecture is envisioned, and what payload-module dimensions, interfaces, power, data, and swap-time targets should be used?

A: We do not specify any payload-module dimensions, interfaces, power, data, and swap-time targets. The proposed platform must support an end-to-end mission lifecycle approach that involves AI-driven mission optimization to configure the ideal vehicle build.

3. What navigation performance is required without Global Positioning System access, including position error growth, fixed-depth station keeping accuracy, and re-localization expectations?

A: There are no specific metrics pertaining to the navigation performance other than the ones restated above.

4. What acoustic-signature and hydrodynamic-wake metrics define acceptable stealth/signature control for the vehicle and multi-vehicle formation?

A: The primary requirement is to demonstrate a mission-configurable vehicle. In regards to hydrodynamic and acoustic signature, the proposer may consider offering a single or swarm of AUVs that can operate either at low speeds with reduced signatures or intentionally reconfigure itself to operate at high speeds incorporating techniques to minimize the radiated noise.

5. What multimodal communications combination is expected for underwater fleet operations, and what bandwidth, range, latency, and outage assumptions should autonomy algorithms tolerate?

A: There are no specific metrics regulating the performance of the communication. They should be appropriate for the envisioned missions.

6. What multi-vehicle behaviors must be demonstrated - formation keeping, cooperative localization, task allocation, distributed sensing, adaptive reconfiguration, consensus, or all of these?

A: The only specific requirements are supporting operations up to 24 hrs and able to achieve fixed-depth station-keeping. We expect the open architecture to allow for a wide variety of sensors and payloads, enabling collaborative sensing and other commercial and defense applications across a multifunctional fleet of vehicles.

7. What level of AI-driven mission optimization is expected for configuring the vehicle build and mission plan, and may optimization trade payload, propulsion, endurance, and sensing geometry jointly?

A: There is no pre-determined level of AI involvement. Ultimately, we foresee no humans in the loop outside of mission planning.

8. For Direct-to-Phase-II feasibility, can hydrodynamic/acoustic/formation-control evidence come from different prior platforms within the team, or must it be demonstrated on the specific proposed AUV architecture?

A: It can come from prior platforms, assuming they meet the requirements of mission specific reconfigurability.

9. What at-sea test conditions, mission duration, number of vehicles, environmental conditions, and test-range support should be assumed for Phase II?

A: At-sea test and environmental conditions should be inspired by the contemplated missions. The platform should meet the requirements of being a mission-configurable, flooded-full architecture that supports rapid-swap payloads and upgradeable subsystems for a variety of missions.

10. What open software standards, middleware, interface-control definitions, and Government autonomy/navigation stacks should be supported to maximize transition and third-party payload integration?

A: No standards, interface-control, or autonomy stacks are specified in the SBIR solicitation. We are requesting an integrated software ecosystem encompassing objective-based mission planning, command-and-control, and centralized data analytics hubs.