

Uncrewed Underwater Vehicle

Boeing to Develop New Payloads, Capabilities & Missions for UUVs Officials of the US Naval Sea Systems Command in Washington announced they are asking the Boeing Defense, Space & Security segment in Huntington Beach, Calif., for engineering services to expand the XLUUV's role in future naval operations. The modular-construction Boeing Orca XLUUV is to be an open-architecture reconfigurable uncrewed underwater vehicle (UUV) with the core vehicle providing guidance and control, navigation, autonomy, situational awareness, core communications, power distribution, energy and power, propulsion and maneuvering, and mission sensors, Navy officials say. Boeing won a \$43 million Navy contract in early 2019 to build four XLUUVs, which are autonomous mini-submarines based on the Boeing-designed Echo Voyager large UUV.

Echo Voyager's advanced autonomy enables it to operate in clear and congested waters without physical human contact. The Echo Voyager has a range of 6,500 nautical miles on one fuel module, can reach depths of 11,000 feet, and can operate independently for months underwater. It is 51 feet long, with a modular payload section as long as 34 feet and a volume of 2,000 cubic feet. Boeing unveiled the Echo Voyager in early 2016 and began sea trials of the unmanned undersea craft in summer 2017. The large UUV's navigation system uses a Kalman-filtered inertial navigation unit supported by Doppler velocity logs and depth sensors. Powering the vessel is a hybrid combination of batteries and marine diesel generators. It can launch from shore or large military ships with well decks or large civil vessels with moon pools. The Lockheed Martin Rotary and Mission Systems segment in Riviera Beach, FL, also has been involved in designing prototype XLUUV systems.

The Boeing Orca XLUUV will have well-defined interfaces for future upgrades to capitalize on advances in technology and respond to threat changes. The Orca XLUUV will have a modular payload bay with defined interfaces to support current and future UUV payloads. XLUUVs, which are among the largest unmanned submersibles ever conceived, will be for long-endurance surveillance missions or undersea cargo vessels to deliver other sensor payloads and other UUVs. These large unmanned undersea vehicles eventually could be used as motherships to deploy and recover smaller surveillance UUVs on far-flung reconnaissance, surveillance, or special warfare missions in the open ocean or along coastlines and inside harbors.

The Navy's XLUUV project moves to enable technologies forward that was developed initially in other projects such as the DARPA Hydra program to develop an unmanned submersible large enough to transport and deploy UAVs and UUVs stealthily in enemy territory to respond quickly to situations around the world. On this order, Boeing will do the work in Huntington Beach, Calif.; and Cockeysville, MD, and should be finished by September 2021.