Navy’s Orca XLUUV Will Carry 34-Foot Payload Module for Mine Laying

A graphic illustration of the Orca, an extra-large class unmanned undersea vehicle. *U.S. NAVY*

ARLINGTON, Va. — The Orca extra-large unmanned underwater vehicle (XLUUV) being built by Boeing for the Navy will carry a large payload module for covertly deploying sea mines and other payloads, a Navy official said. The Navy also will have an extra vessel built for test purposes.

Capt. Scot Searles, the Navy’s program manager for Unmanned Maritime Systems, speaking May 25 in Monterey, California, at the 15th International Mine Technology Symposium of the Mine Warfare Association, said the payload module is 34 feet long, designed to be carried by an Orca to an area at which to lay the mines.

Boeing is building five Orcas, the first of which will begin in-water testing later this summer, Searles said. The first Orca was placed in the water in April.

The 80-ton Orca XLUUV is an open-architecture, reconfigurable UUV that will be modular in construction. The XLUUV core vehicle will provide guidance and control, navigation, autonomy, situational awareness, core communications, power

distribution, energy and power, propulsion and maneuvering, and mission sensors. The Orca, too large to be carried by a submarine, will be pier-launched. Mine laying will be the first role for the XLUUV.

“Getting that large, unmanned diesel submarine put together and then putting it in the water is a big deal,” Searles said. “It’s an important step in the development of the program to be able to have the components together, do a fit check and then an in-water check. We will continue populating the hull and begin to do in-water testing later this summer, all driving program maturity forward.”

The Orca is based on the smaller Echo Ranger UUV built by Boeing.

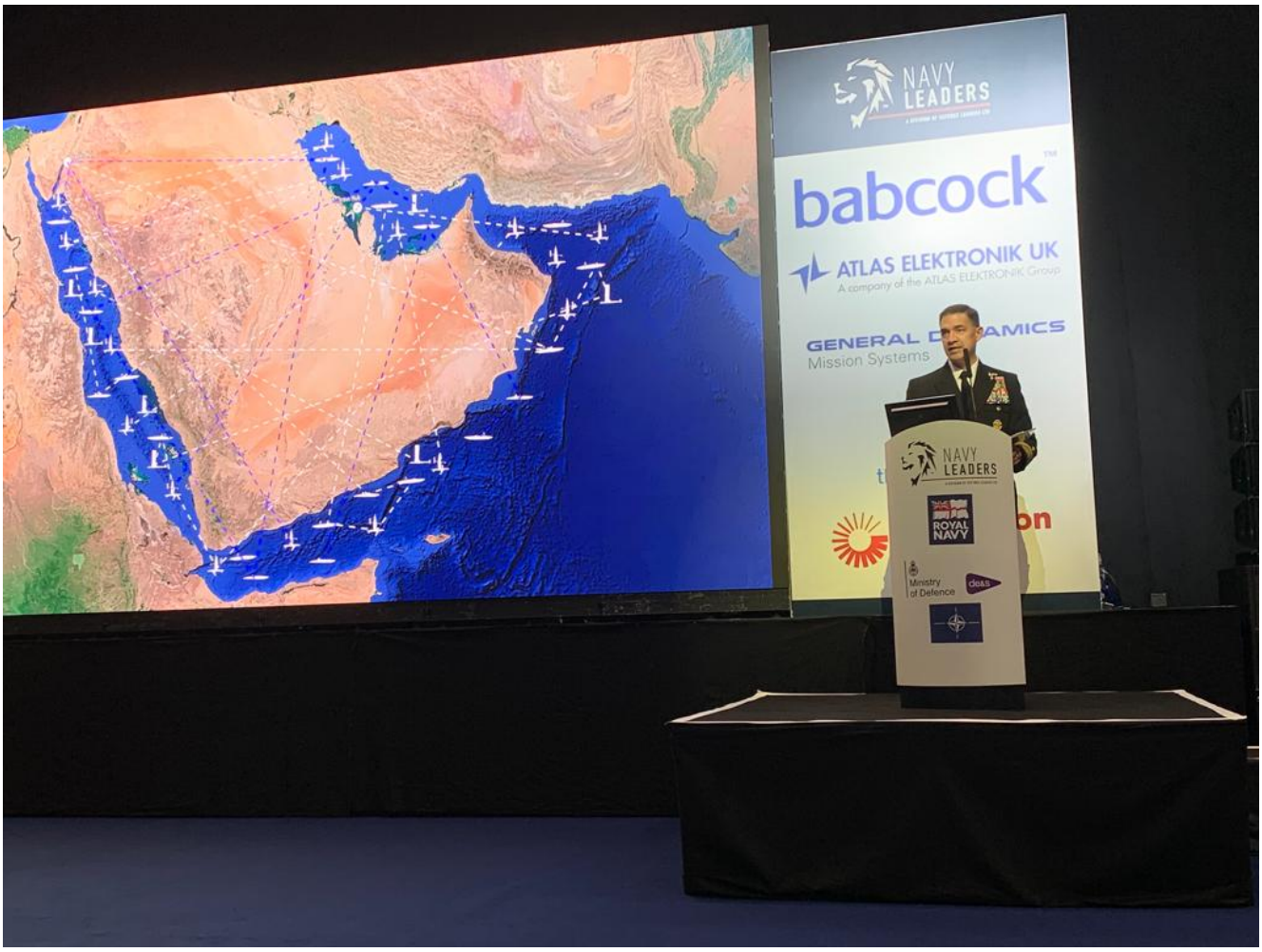
“Leveraging that technology, we’ve decided to add another EDM [engineering development model] into that program as well,” he said. “We’re calling it XLE-0. It’s a risk-reduction asset in addition to the five articles that we will deliver to the fleet, [so] we’ll also have that test asset as well.”

Searles pointed out the speed of the development of Orca as a first-of-class ship.

“That capability is going to deliver in less than five years to the fleet,” he said. “There is no first-of-class ship out there that is going from concept to requirements development to fielding in that kind of timeline.”

Searles praised “the very tight collaboration” between the science and technology community, academia, the defense industry and its internally funded research, and the various Navy research and acquisition offices for the rapid development of the Orca.

US 5th Fleet Commander Explains Role of Unmanned, AI in Middle East



Vice Adm. Brad Cooper speaks at the Combined Naval Event in the United Kingdom. *U.S. NAVY*

LONDON – The commander for U.S. naval forces in the Middle East discussed the role of unmanned systems and artificial intelligence in naval operations at an international security conference in the United Kingdom, May 24, NAVCENT Public Affairs said May 25.

Vice Adm. Brad Cooper, commander of U.S. Naval Forces Central

Command, U.S. 5th Fleet and Combined Maritime Forces, spoke to an audience of nearly 800 international defense and industry leaders during the Combined Naval Event at the Farnborough International Exhibition and Conference Centre.

“We are on a path to build the world’s first international unmanned surface vessel fleet,” Cooper said. “Three weeks ago, we surpassed 10,000 total sailing hours for unmanned surface vessels throughout the region. Additionally, two vessels each exceeded 100 consecutive operating days at sea.”

U.S. 5th Fleet is currently fielding multiple unmanned systems with artificial intelligence across the Middle East after establishing Task Force 59 in September. The task force works closely with members of industry and academia as well as other experts to provide operator feedback and help drive the innovation process forward.

“The goal is a distributed and integrated network of systems, operated with our partners, to significantly expand how far we can see,” said Cooper.

Over an eight-month period, the task force stood up operating hubs for unmanned systems and artificial intelligence in Bahrain and Aqaba, Jordan while deploying new unmanned systems to a half-dozen bilateral and multilateral exercises. Additionally, some of the systems are currently contributing to daily operations in regional waters by enhancing maritime surveillance.

“Every partner and every sensor offers new information that can be added to what we call the ‘Digital Ocean,’ an intelligent synthesis of around-the-clock inputs encompassing thousands of images,” Cooper said. “Putting more eyes above, on and below the water’s surface enhances our picture of the surrounding seas and enables us to position our crewed ships to react more rapidly.”

Earlier this year, U.S. 5th Fleet announced the goal of

forming a multinational fleet of 100 unmanned surface vessels by the summer of 2023.

“A network of partners can increase shared maritime domain awareness by 30 or 40 times, through an interconnected mesh of sensors and real-time data fused together,” Cooper said. “This is an ambitious goal, but it is achievable because of our incredibly talented team.”

U.S. 5th Fleet led the world’s largest unmanned maritime exercise in February when 10 nations fielded more than 80 unmanned systems during International Maritime Exercise 2022. The exercise enabled operators employ advanced unmanned systems during 14 different operational scenarios.

“We are clearly more capable when we operate together, which is why strengthening partnerships and accelerating innovation are intertwined,” said Cooper. “It is not just about the technology. It is our people who have us on a path to realizing this vision together with our partners in the region.”

The U.S. 5th Fleet area of operations encompasses about 2.5 million square miles of water area and includes the Arabian Gulf, Gulf of Oman, Red Sea and parts of the Indian Ocean. The region is comprised of 21 countries and includes three critical choke points at the Strait of Hormuz, the Suez Canal and the Strait of Bab al-Mandeb at the southern tip of Yemen.

Bollinger Delivers 49th Fast

Response Cutter to U.S. Coast Guard

U.S. Coast Guard Cutter Douglas Denman. *BOLLINGER SHIPYARDS*

LOCKPORT, La. – Bollinger Shipyards LLC has delivered the USCGC Douglas Denman to the U.S. Coast Guard in Key West, Florida. This is the 175th vessel Bollinger has delivered to the U.S. Coast Guard over a 35-year period and the 49th Fast Response Cutter delivered under the current program.

"I could not be more proud of the over 650 men and women of the Bollinger team that built the USCGC Douglas Denman," said Bollinger President & CEO Ben Bordelon. "Pound for pound, the quality and capabilities of the FRC platform is unmatched and can be looked upon as a model government acquisition program. We look forward to continuing to support the U.S. Coast Guard for decades to come."

The USCGC Denman will travel to Alaska where it will be commissioned on September 28 in its new homeport of Ketchikan, in the 17th District of the Coast Guard. Once there, it will serve and safeguard the public, protect the environment and its resources, and defend the nation's interests in the Alaskan maritime region. The 17th District encompasses over 3,853,500 square miles and over 47,300 miles of shoreline throughout Alaska and the Arctic.

Each FRC is named for an enlisted Coast Guard hero who distinguished themselves in the line of duty.

Douglas Denman joined the Coast Guard at the age of 18. Showing promise as a boat driver, he was sent to New Orleans to train at Higgins Industries, builder of the U.S. military's first operational landing craft. Denman was assigned to the Number 4 landing craft aboard the USS Colhoun as coxswain. After landing Marine Raiders at Tulagi Island in August 1942, the Colhoun patrolled, delivered provisions and war material to the Marine 1st Division on Guadalcanal Island. During patrols Japanese bombers attacked the Colhoun, with the bombers destroying Denman's Higgins Boat.

Denman received severe facial wounds as he was thrown up against a bulkhead. Denman remained onboard as he and a shipmate carried wounded comrades to the ship's bow and floated them clear of the sinking ship. He and his shipmate gathered dozens of life jackets and threw them to victims struggling to stay afloat in the oily water. Denman managed to jump off the vessel before the ship slid below the surface. Denman saved many lives while risking his own. Denman survived along with 100 of Colhoun's original crew of 150 officers and men.

For his wounds and heroism in the face of great danger, Denman received the Silver Star and Purple Heart medals.

HII Announces New Vice President of Columbia-Class Program

Brandi Smith, right, is succeeding Charles Southall as vice president of the Columbia-class submarine program at HII's Newport News Shipbuilding division. *HII*

NEWPORT NEWS, Va. – HII announced May 26 that Brandi Smith has been named vice president of the Columbia–class program at the company's Newport News Shipbuilding division. Smith will succeed Charles Southall, who will retire July 1 after more than 35 years of distinguished service.

The U.S. Navy has identified the Columbia class as its No. 1 acquisition priority. Twelve Columbia-class boats will replace

the fleet of Ohio-class nuclear ballistic submarines and take over the role of the nation’s sea-based strategic deterrent; these submarines will provide the most survivable leg of the nation’s strategic triad.

Southall began his Newport News Shipbuilding career in 1986 as an engineering intern in the submarine program and has served in various roles of increasing responsibility. During his tenure as director of advanced submarine programs, he established the Columbia-class submarine program office. Southall also served as the division’s chief engineer and engineering vice president, responsible for leading engineering efforts across all Navy programs.

“Since the very beginning of his career, Charles has demonstrated deep commitment and ownership for every program, every assignment and every ship he has supported,” said Jennifer Boykin, president of Newport News Shipbuilding. “His leadership and technical acumen have shaped the design and construction of our nuclear fleet for more than three decades, and his impact will endure for generations to come.”

On June 1, Smith will assume her new role leading company-wide management, leadership, cost, schedule and technical performance of the Columbia-class program. Smith will report to Matt Needy, vice president of Navy programs.

“Brandi’s experiences encompass a breadth of service on every ship class in our portfolio from ‘design-build’ through ‘in-service’ maintenance,” Boykin said. “Her academic, technical, industrial and proven leadership has uniquely prepared her for this role.”

Smith began her career at Newport News in 2002 as an engineer in the carrier overhaul program. She has held positions of increasing responsibility throughout her career, including interim director of construction engineering for the Ford class, engineering lead for Integrated Digital Shipbuilding,

director of quality control responsible for all nuclear, non-nuclear, and non-destructive testing inspectors and most recently serves as Columbia-class construction program director.

She earned a mechanical engineering degree from North Carolina State University and an MBA degree from The College of William and Mary.

Navy Orders Tomahawk Cruise Missiles for Marine Corps, Army

Sailors aboard the Emory S. Land-class submarine tender USS Frank Cable (AS 40) prepare to transfer an inert Tomahawk

missile training shape from the Frank Cable to the Los Angeles-class fast-attack submarine USS Springfield (SSN 761) on April 24. *U.S. NAVY / Mass Communication Specialist 1st Class Charlotte C. Oliver*

ARLINGTON, Va. — The U.S. Navy put in another order for Tomahawk cruise missiles May 24, but this order also includes, for the first time, Tomahawks for the Marine Corps and Army.

Raytheon Missiles and Defense, of Tucson, Arizona, was awarded a $217.1 million fixed-price-incentive, firm-fixed-price contract for 154 full-rate production Block V Tactical Tomahawk All-Up Round Vertical Launch System missiles, including 70 for the Navy, 54 for the Marine Corps, and 30 for the Army, the Defense Department said May 24. The full-rate production Lot 18 missiles are scheduled to be delivered by 2025.

“This is a major accomplishment for the program as we move forward into a new era for the Tomahawk Missile System,” said Capt. John Red, Tomahawk Weapons System program manager (PMA-280), said in a May 24 release from the Naval Air Systems Command. “We look forward to delivering this capability not only to the fleet, but to our Marines and Soldiers around the globe.”

The Lot 18 missiles will be of the Block V configuration, which has the capability for inflight course guidance and target location updates.

“Future Block V capabilities will include the Maritime Strike Tomahawk variant and the Joint Multiple Effects Warhead System,” the release said.

The Marine Corps is developing and fielding a ground-based Tomahawk launcher, which will be operated by ground units in support of Expeditionary Advance Base Operations.

The Navy’s Tomahawk program office “worked closely with the Army’s Rapid Capabilities and Critical Technologies Office to

execute the contract in an effort to deliver the missiles on an accelerated schedule," the Navy said. "The Army is leveraging PMA-280's ongoing modernization efforts, investment strategies, and joint test events for its Mid-Range Capability program, a system that is on track to be delivered to its first Army unit in FY23."

The same day, according to the Defense Department, Raytheon was awarded a $22.6 million contract modification that "provides for the production of the Navy/Marine Corps Expeditionary Ship Interdiction System (NMESIS) Naval Strike Missile (NSM) Launcher Unit (NLU) and Weapon Control System (WCS) Production Representative Models. NMESIS is a land-based missile launcher platform that provides the Fleet Marine Force with an anti-ship capability. NMESIS integrates an NLU, capable of launching two NSMs, onto a remotely operated ground unit for Expeditionary Fires carrier. The NLU is controlled by the WCS located externally in a command-and-control vehicle."

Navy Unmanned Task Force Lead: Common Control System Critical to Enable Artificial Intelligence

An MH-60S Sea Hawk and MQ-8C Fire Scout unmanned aerial vehicle, assigned to Helicopter Sea Combat Squadron 23, conduct concurrent flight operations as a manned-unmanned team while embarked on the Independence-variant littoral combat ship USS Jackson (LCS 6). *U.S. NAVY / Lt. j.g. Alexandra Green*

ARLINGTON, Va. – The head of the Navy's Unmanned Task Force said a control system common for aerial, surface and underwater unmanned systems is still the goal as the Navy develops and fields unmanned systems for the fleet, and is critical to enabling artificial intelligence for data management.

"Certainly," said Michael Stewart, leader of the Unmanned Task Force, speaking to reporters May 25 at the Pentagon, when asked if the Common Control System is progressing to operate for all three domains.

"If you're going to enable AI [artificial intelligence], if you're going to have multiple sensors, you have to solve the open-architecture data management problem and you have to have a common control system so that you can take all of this

sensor data and then put it in something where you can run algorithms," Stewart said.

"We've talked with some of our allies of their journey through that it only highlighted that that is the critically important thing," he said. "When I showed up at NATO at first, some people were talking about standards and open architecture, I really didn't understand the importance of it.

"Now that I've seen it in operation with some of the allies, I understand critically why it's important and why we have to go do that right, because if you want to make AI a thing with a whole bunch of different sensors, you've got to be able to do that," he said.

The Unmanned Task Force is a team of teams with the mission of "bending the curve" of fielding unmanned systems to solve operational problems and deliver solutions more rapidly.

"We're doing unmanned to solve operational problems; we're doing artificial intelligence to solve operational problems," Stewart said.

He also said funding had to be very agile to move funding around portfolios to achieve rapid development where it is needed most.

Stewart said the task force wants experimentation to establish the relative value of various unmanned concepts and systems while "dispelling the mythology of unmanned and AI."

"Let's let them prove what we think they can do," he said.

Northrop Grumman Integrating Systems for Coast Guard's Offshore Patrol Cutter

Northrop Grumman is integrated the control systems for the Coast Guard's Offshore Patrol Cutters, such as the USCGC Argus, shown here. *NORTHROP GRUMMAN*

ARLINGTON, Va. — Northrop Grumman is integrating the control systems for the U.S. Coast Guard's Offshore Patrol Cutters being built by the Eastern Shipbuilding Group in Panama City, Florida.

The systems are being readied for installation in the four cutters when they are ready to receive the systems. The company is also looking beyond to other programs, including the Navy's DDG(X) next-generation destroyer program

Northrop Grumman is "the prime ship integrator for the OPC, amongst delivering many other capabilities to that platform, to include the navigation system, the bridge systems, the machinery control systems," said Rudy Fernandez, director for

Strategy and Business Development, Naval and Oceanic Systems, Northrop Grumman Mission Systems, in an interview with *Seapower*. “So, we integrate all of that, plus other systems for the platform.”

Northrop Grumman has had plenty of experience integrating systems on other warships, Fernandez said, including bridge and navigation system for the Navy’s Arleigh Burke-class guided-missile destroyers, including the WSN-7 and WSN-12 inertial navigation systems and the machinery control systems.

“The new role for us is the system integrator role, which we really value in the partnership we have with ESG to be able to carry out that role in support of this very critical Coast Guard program,” he said.

Northrop Grumman’s Maritime Systems and Integration Operating Unit is part of its Naval and Oceanic Systems Business Unit, which is part of the Maritime Land Systems and Sensors Division in Charlottesville, Virginia. The company competed for the OPC contract as part of the Eastern Shipbuilding Group team.

Northrop Grumman built a land-based test facility and a test and integration facility in Charlottesville that is used to test equipment before it is shipped to ESG.

“Working with ESG, we’ve also been able to build a mock-up of the [OPC’s] bridge and navigation center so that we could test all the equipment that we are delivering in a much more integrated fashion before it goes on the ship itself,” Fernandez said, noting that the facility is at one of ESG’s shipyards and is helping to reduce risk in the program.

Fernandez said his company is involved in pursuing the contract for the second batch of OPCs, but he was not at liberty to discuss which builder it was teamed with, “but I can tell you we’re very anxious to see that award come

through.”

He said the down-select was expected “in the near term.”

Northrop Grumman is looking at the Coast Guard’s Waterways Commerce Cutter program, but Fernandez was not free to provide any details of the company’s plans. The company also is looking at potential work of future contract awards for polar security cutters. Fernandez also said his company was “very attuned” to the Navy’s future DDG(X) program.

“DDG(X) is an exciting opportunity for us … and we’ve interacted with our customer on several occasions already to understand better where they’re going,” he said, noting Northrop Grumman already delivers the power systems for the SPY-6 radar and SLQ-32 Surface Electronic Warfare Improvement Program. The effort is focused on the DDG(X)’s integrated power system.

“We’ve already done a tremendous amount of risk reduction for that platform,” he said. “We’re making as a company tremendous investment in that area.”

Fernandez also said his company is very interested in developing or adapting power systems and controls for the Navy’s future unmanned surface vessels.

“That’s going to take a bit of ingenuity because automation and reliability have to come into play,” he said.

Navy: Mine Countermeasures

Mission Packages to Be Available for Vessels of Opportunity

The expeditionary sea base ship USS Miguel Keith (ESB 5) conducts flight operations during Exercise Noble Vanguard. ESBs are likely vessels of opportunity for mine countermeasure packages. *U.S. NAVY / Mass Communication Specialist 2nd Class Gregory A. Pickett II*

ARLINGTON, Va. – The Navy's mine countermeasures mission packages will be available not only to littoral combat ships but to other vessels and units, a Navy official said.

Capt. Mike Egan, branch head for mine warfare in the Office of the Chief of Naval Operations, speaking May 24 in Monterey, California, at the 2022 International Mine Warfare Technology Symposium of the Mine Warfare Association, said the MCM mission package is on track to achieve initial operational

capability in the fall of 2022 and the Navy plans to procure a total of 24 packages.

The Navy plans to equip 15 Independence-class littoral combat ships with the MCM mission package, which will leave an additional nine mission packages for use elsewhere.

Egan said those excess mission packages won't be sitting around in a warehouse.

"We're going to put them on vessels of opportunity, put them ashore, we're going to integrate them into ExMCM [expeditionary MCM] companies to use those and try to make sure [to] step up MCM capability to be expeditionary, to be scalable [and] modular," he said. "That's where we're headed."

The Navy's expeditionary sea-base ships, which already host MCM forces, are considered likely vessels of opportunity for an MCM mission package. These ships host MH-53E MCM helicopters and mine-hunting craft and unmanned underwater vehicles.

The Navy has commissioned three Lewis-B. Puller-class ESBs and has two more under construction.

Charles River Analytics: Artificial Intelligence is Challenged in Arena of

Competition

The intuitive user interface of the Explainability and Terrain Reasoning for Autonomy (EXTRA) effort will deliver human-understandable explanations of deep reinforcement learning software behavior. *CHARLES RIVER ANALYTICS*

ARLINGTON, Va. – A small company developing artificial intelligence technology for the Office of Naval Research is halfway through a 24-month contract performance toward demonstrating its AI technology for the Navy.

"It's all about trying to develop technologies that can help decision makers," said Jeff Druce, senior research scientist at Charles River Analytics, in an interview with *Seapower*. "They have lot on their plate as far as the watch-floor commanders, making decisions with limited, partial, incomplete information.

"AI has shown – at least in an academic setting – promise at being able to reason about these complex scenarios and make really effective decisions in a variety of arenas," Druce said, noting rhetorically that with autonomy, "Can you have a system that gives information about the world and tries to

take actions that are going to beneficial to the entity in some way?

“There’s not a lack of information out there; it is getting the right information in the right format to be useful,” he said. “What is the relevant information, especially if you’re in a divided-attention task, it becomes like a human-factors problem, as in, ‘What is the most useful information to provide this person in what format that they can use it to make better decisions?’”

Druce envisions AI “as not taking over at all but very much a collaborative human-machine teaming where AI can handle these processes that require a lot of attention and are time consuming but sort of easy to be done in that there’s no incredibly challenging reasoning that has to be done but ultimately will help with the attention problem of the human user.”

Charles River Analytics started out with Small Business Innovative Research Phase 1 work, Druce said, but “a lot of that technology and that motivation ended up going into this larger, EXTRA [Explainability and Terrain Reasoning for Autonomy] effort [for ONR].

“We’re trying to bring in some of the modern AI tools” to the effort, he said. “The deliverables are mostly demonstrations and software based. These things are pretty leading edge.”

Druce said a “demonstration in a representative domain that these autonomous agents are doing reasonable things could lead towards a good performance in the physical environment.”

He said the technology his company develops needs to be demonstrated in an “arena of competition … pitting AIs against each other to see how they perform. … Can you take your technology and pit it against somebody else’s in a less-controlled environment … and see how it does?”

Druce said AI is challenging to his company's workers, but the challenge is what promotes their best work.

"These are hard questions with unknown answers," he said. "When you give smart people these challenging problems, you can see that [with] doing cool things, they motivate themselves."

U.S. Navy Releases Command Investigation into USS Connecticut Grounding

The Seawolf-class fast-attack submarine USS Connecticut (SSN 22) departs Naval Base Kitsap-Bremerton for deployment, May 27, 2021. Its underwater collision happened a few months

later. *U.S. NAVY / Lt. Mack Jamieson*
PEARL HARBOR – The U.S. Navy has released the command investigation into the USS Connecticut (SSN 22) grounding that occurred Oct. 2, 2021, the U.S. Pacific Fleet said May 23.

USS Connecticut grounded on an uncharted seamount while operating submerged in a poorly surveyed area in international waters in the Indo-Pacific region. The investigation determined the grounding was preventable. Specifically, the grounding resulted from an accumulation of unit-level errors and omissions in navigation planning, watch team execution and risk management, all of which were deemed to fall far below U.S. Navy standards.

The investigation and endorsements describe what happened, promulgate lessons learned, memorialize completed corrective actions, document accountability actions and delineate pending actions that must be finalized with a sense of urgency.

In addition to addressing the unit-level errors that caused the grounding, the investigation highlighted specific areas for improvement in the deployment training and certification process, and the Navy is urgently implementing these improvements across the Submarine Force. This investigation delineates 28 corrective actions, of which 14 actions are complete, 13 actions are in progress, and one is enduring.

In implementing these significant improvements, the Navy said it will become a more effective fighting force.