

# Command (C2) Systems Powered by Artificial Intelligence (AI): The Pentagon’s AI ‘Ghost Fleet’ Is More than Just Scary — It’s Unwise.

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*In an October [address](#) at the Center for Strategic and Budgetary Assessments, Secretary of Defense Mark Esper unveiled the Pentagon’s plan for the future Navy, saying it would consist of over 500 warships — almost twice the number now in the U.S. inventory.*

A larger fleet was needed, he said, to counter the Chinese naval buildup and to ensure U.S. naval dominance well into the future. Esper indicated, however, that a Navy of 500 ships would not constitute an enlarged version of the current force — a feat probably far beyond the Navy’s fiscal and shipbuilding capabilities. Rather, it would contain approximately the same number of conventional warships now in the fleet plus “between 140 to 240 unmanned and optionally manned surface and subsurface vessels of all types.”

Huh? What are these unmanned vessels and what will they do? Can unmanned and “optionally manned” (whatever that means) vessels supplant conventional warships and provide the seapower advantage Esper claims we require? Nowhere in his October 6 speech or in other Pentagon statements can you find answers to these critical questions.

That the Navy, the Defense Department, and the Defense Advanced Research Projects Agency (DARPA) have been investigating the potential for replacing human crews with command-and-control (C2) systems powered by artificial intelligence (AI) on naval vessels is no secret. In April 2016, DARPA announced the initial launch of the *Sea Hunter*, a 132-trimaran designed to patrol the high seas in search of enemy submarines with no humans aboard. A similar initiative, with the suggestive name “Ghost Fleet Overlord,” was conducted by the Strategic Capabilities Office of the Office of the Secretary of Defense in 2018 and 2019. Both efforts sought to explore the possibilities of combining commercially available hulls and hardware with cutting-edge computer software to enable uncrewed vessels to navigate themselves and perform a variety of military missions.

For Navy leaders, the development of unmanned vessels is thought to have many advantages. To begin with, they do not require extensive crew quarters and so can be made smaller and for less money. At a lower price, you can buy more of them than you can of conventional, manned warships, so you can build a bigger fleet — that aspirational 500 number — without busting the budget.

In fact, Navy strategists now speak of a “distributed” fleet, consisting of a larger number of smaller, unmanned vessels in place of a smaller force of large capital ships. And, in an era in which large surface warships are becoming increasingly vulnerable to enemy anti-ship

missiles, you can risk sending unmanned ships into highly contested waters, such as the South China Sea, where you might not want to send a carrier with thousands of sailors aboard.

All this represents [“a shift in mindset,”](#) said the Navy’s Surface Warfare Director, Rear Admiral Ronald Boxall.

“Instead of putting as much stuff on the ship for as much money as I have, you start thinking in a different way.... You start saying: ‘How small can my platform be to get everything I need on it?... And when I look at the force, I think, ‘Where can we use unmanned to so that I can push it to a smaller platform?’”

Inspired by this “mindset,” the Navy has invested billions of dollars in the development of two new classes of warships: a medium unmanned surface vessel (MUSV) and a large unmanned surface vessel (LUSV). Contracts have been awarded for the design of both types, with no conception of what they might look like, how they will be propelled, or what functions they may perform once put to sea.

In Fiscal Year 2020, the Navy was awarded \$408 million to conduct research, development, test, and evaluation (RDT&E) on two large unmanned surface vessels, and the Pentagon requested another \$464 million for RDT&E work on an additional pair of LUSVs in FY 2021, with some of those funds intended for research on enabling technologies for an MUSV. If the Navy’s five-year shipbuilding request is fully funded, it will invest a total of \$3.3 billion on LUSV and MUSV development and procurement over fiscal years 2021 to 2025.

Look through Pentagon procurement documents, however, and you will find scant information about the nature or function of these vessels. All that is said about them in the Fiscal Year 2021 Budget Request submitted to Congress in February by the Office of the Under Secretary of Defense (Comptroller) is these are “low-cost, high-endurance, reconfigurable ships able to accommodate various payloads for unmanned missions.” And, in an acknowledgement of the Navy’s uncertainty about these ships’ ultimate role, it added, “Future missions and payloads will be informed as the concept of operations is developed.”

Defense industry journalists have suggested a variety of missions for these vessels. Some say their primary task will be to hunt for enemy submarines. Paul McLeary, writing in [Breaking Defense](#), says they could be used to deploy small underwater drones for detecting submarines in advance of manned vessels. Others suggest they will serve as floating “missile magazines,” providing the Navy with added firepower. According to David Larter of [Defense News](#), they will be equipped with vertical launch tubes for ballistic missiles of various types. The truth of the matter is, however, that no one knows for sure what these ships will do, as the Navy has yet to figure this out.

Questions have also arisen about the software that will govern these ships in the absence of human pilots and commanders. The *Sea Hunter* has succeeded in undertaking long voyages on its own, navigating the seas and returning to base, but this is not the same as conducting military operations in contested areas under wartime conditions. Much of the C2 technology is still in the experimental stage, and Navy officials cannot be certain when all the necessary components will be capable of functioning together harmoniously. Some analysts worry, for example, that AI-governed ships could lose connectivity with manned vessels and “go rogue,” firing their missiles or undertaking other military actions not intended by their

human overseers.

The fact that the Navy cannot specify the future role of these ships or guarantee that all the necessary software will perform as intended has caused unease among many in Congress. In its FY 2021 markup of the National Defense Authorization Act (NDAA), the House Subcommittee on Seapower and Projection Forces banned the use of funds for the procurement of large unmanned surface vessels until the Secretary of the Navy certifies in writing that all of its key components, including the hull, mechanical system, and autonomous features have been fully tested and proved to be reliable; roughly similar language is contained in the Senate version of the bill. The House and Senate have yet to reconcile their versions of the NDAA, so it is unclear whether a requirement of this sort will appear in the final text of the bill, but it is likely that the Navy's plans to push ahead with the development and production of unmanned vessels will be subjected to ongoing Congressional scrutiny and limitations.

The Navy clearly hopes that by floating a few prototype LUSVs and MUSVs, it can win over skeptics and demonstrate the utility of unmanned vessels. Ships of these types obviously have their admirers among senior Pentagon officials, and so we can assume they will figure prominently in future Navy budget requests — whoever sits in the White House next year. But it would be wise to view such requests with a great deal of skepticism.

Do unmanned vessels fill an actual naval requirement? If so, what is that requirement, and why will such ships best satisfy it? It seems highly imprudent to begin building LUSVs and MUSVs until these questions can be answered — especially given the concerns about relying on wholly autonomous weapons systems. Reducing the risk to American sailors is obviously a desirable objective, but if the solution involves the creation of a “ghost fleet” of possibly unreliable unmanned vessels that Navy commanders feel free to deploy in highly-contested waters, the final outcome may not be reduced danger to our sailors but far greater.

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