DARPA Director Praises Navy's Aggressive Use of Autonomous Sea Hunter

Sea Hunter is moored at Joint Base Pearl Harbor-Hickam, Hawaii. The director of DARPA on May 1 praised the Navy's aggressive use of the unmanned surface vessel. Mass Communication Specialist 1st Class Nathan Laird

The director of the nation's premier government innovation organization is excited about the U.S. Navy's aggressive use of an unmanned surface vessel to experiment with the military applications of advanced automation and artificial intelligence.

"The most exciting thing I'm really happy with the Navy right now is what they're doing with the Sea Hunter, which is an autonomous 132-foot surface ship that DARPA demonstrated a couple years ago," Steven H. Walker, director of the Defense Advanced Research Projects Agency, told a Defense Writers breakfast on May 1. "The Navy has really taken that and is using it and experimenting with it."

Walker cited Sea Hunter's voyage last fall from San Diego to Hawaii and back with no humans on board to control it, "which I think demonstrates the autonomous capability we put into that program."

"They're really interested in how that helps them with their distributed lethality program," and using Sea Hunter as "the

basis for their
medium-size and large-size unmanned surface vessels. I'm really excited about
where they're taking that system."

The Navy is projecting unmanned vessels as a key element of its
future combat fleet and has proposed buying 10 "large" unmanned ships over the
next five years. It has not defined the size and capabilities of those vessels.

Although the Navy has not indicated whether it plans to test weapons on Sea Hunter, the likelihood that some of its future unmanned vessels
will be armed raises the controversial issue of what control humans will have
over weapon employment by autonomous platforms.


Sea Hunter completes an autonomous sail from San Diego to Hawaii and back – the first ship ever to do so autonomously. U.S. Navy photo
DARPA, which is pursuing advances in artificial intelligence (AI),
studies the ethical issue of weaponized unmanned systems.

"I think it's still important to have that lethal decision rest
with the human," Walker said. But, he noted, "Sea Hunter has a lot of potential
uses that don't involve weaponizing it," such as mine countermeasures and as a
sensor.

"The key to autonomy, particularly in the ocean, is getting out
and experimenting, testing how these things work," which was why he was so

pleased with the Navy's use of Sea Hunter.

Much of Walker's discussion with defense reporters focused on DARPA's work on AI, which it has been doing for 50 years.

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>
> *DARPA director Steven H. Walker*

"We're pretty excited, not only by the latest advances in machine learning, but moving into what we call the third wave [of AI] — how humans and machines become partners. Not just using machines as tools but as partners," he said. "If we actually can build this team, you can think about all sorts of things that warfighters could do more effectively in a time of war."

Walker also discussed DARPA's work developing more powerful lasers in smaller packages and in moving hypersonic technology into useable weapon systems.

Having demonstrated solid state lasers, which while fairly powerful were "still pretty big," DARPA is focusing now on fiber lasers, which have the promise of even greater power in much smaller packages. Walker said he expected to fully demonstrate a high-powered fiber laser by the end of the year.

He said the first military application for those more powerful lasers "comes in ships and ground vehicles, where weight and

size are not as
big an issue. I think we’re still a ways away from putting these things on
airplanes.”

One of DARPA’s highest priorities is advancing hypersonic technology, which Walker said the United States led the world, but which “some
of our adversaries” have turned into capabilities. Hypersonic generally is described
as Mach 5 or faster. China and Russia have demonstrated different forms of
hypersonic aircraft.

DARPA is working on two applications of hypersonic – a boost-glide
missile, which is rocket-propelled to a high altitude then glides at hypersonic
speeds to a target, and a propelled system that may use a rocket to get to
hypersonic velocity then maintains that speed with some form of air-breathing
engine, such as a scramjet.

He expected to fly each of those systems late this year or early
in 2020.

“The advantage of
hypersonics is not only the speed but the range and maneuverability,” Walker
said.