Navy’s Next-Generation Air Dominance Increment to Replace EA-18G, Admiral Says

An EA-18G Growler prepares to launch from the flight deck of the aircraft carrier USS Harry S. Truman (CVN 75) in this 2013 photo. The Growler is due to be replaced by the Navy’s Next-Generation Air Dominance (NGAD) family of systems. *U.S. NAVY / Mass Communication Specialist 2nd Class Lyle H. Wilkie III*

ARLINGTON, Va. — The U.S. Navy’s Next-Generation Air Dominance (NGAD) family of systems is planned to include a replacement for the EA-18G Growler electronic attack aircraft in addition to the F/A-18E/F Super Hornet strike fighter, a senior official said.

Rear Adm. Gregory Harris, the Navy’s director for Air Warfare, speaking in a March 30 Navy League Special Topic Breakfast webinar, sponsored by General Dynamics, said Increment 2 of

the NGAD program is the planned phase to replace the EA-18G.

Harris said NGAD's Increment 1, the F/A-XX – the planned replacement for the F/A-18E/F – will be the centerpiece of the NGAD family of systems.

"We're going through the study portions of what [Increment] 2 will be to replace the EA-18G Growler, and we expect that family of systems will accommodate manned and unmanned."

The F/A-XX "may or not be manned," Harris said. "The platform meets the fixed-wing portion of the Next-Generation Air Dominance family of systems. We truly see NGAD as more than just a single aircraft. We believe that as manned/unmanned teaming comes online, we will integrate those aspects of manned and unmanned teaming into that. We euphemistically refer to it as our 'little buddy,' an adjunct air-to-air platform, EW [electronic warfare] platform, discussion of whether it could be an advanced early warning platform. We will have to replace the E-2D sometime in the future."

The admiral noted that the notional carrier air wing of the future may have a 60-40 percent manned-unmanned split, but over time will shift to a 40-60 percent manned/unmanned split.

"A lot of that is going to be dependent on the success we see with the MQ-25 Stingray and our ability to truly operate around the aircraft carrier and safely execute that both on the flight deck and in the airplane," he said.

Harris said the NGAD is in the concept refinement phase and is the Navy is working closely with the Air Force NGAD program, "recognizing that the two will likely be different as far as mold lines just based on different services' needs, but a lot of the internal mission systems will be similar and open mission system architecture and government-referenced design that will enable us to use best of breed."

He said the NGAD program is looking to avoid “vendor lock,” whereby the program is locked into using a particular mission system when a superior, less costly or more sustainable system becomes available.

“Industry should look at different ways to team,” Harris said. “Our industry primes get very comfortable with the folks they’ve worked with in the past. Some of that has worked out very well for us; other times it may not have worked a well as well would have liked. I recommended that they broaden their view and look at as many of those folks as they can to team. This will enable a lot of the smaller companies to work into the niche market they may be very successful at.”

Unmanned Missile Carrier a Potential for Aerial Manned/Unmanned Teaming, Admiral Says

The Boeing-owned MQ-25 T1 test asset, a predecessor to the engineering development model aircraft being produced under a 2018 contract award. *THE BOEING CO.*

ARLINGTON, Va. – As the Navy looks forward to fielding its MQ-25A Stingray unmanned carrier-based aerial refueling tanker, it is looking to the future potential of unmanned carrier-based aircraft in other missions, including those involving manned/unmanned teaming and incorporating artificial intelligence. A missile-carrying unmanned aerial vehicle (UAV) is within the imaginable possibilities.

Acknowledging the complexity of developing UAVs for aerial warfare, Rear Adm. Gregory Harris, the Navy's director for Air Warfare, speaking in a March 30 Navy League Special Topic Breakfast webinar, sponsored by General Dynamics, discussed his current thinking regarding said manned/unmanned teaming for tactical combat aircraft.

"Having an unmanned platform out there as an adjunct missile carrier I see as not a step too far too soon," Harris said. "I could have an unmanned friend – typically I say a flying Dorito chip – but I'm thinking it doesn't have to be that way.

An unmanned system with missiles I can clearly in my mind envision a way to say: ‘Defensive combat spread; shoot on this target, and I will squeeze the trigger,’ or ‘I will just enable that unmanned platform to shoot a designated target.’ That doesn’t stretch beyond the realm of my imagination.”

“When I have that unmanned platform making decisions which target anything it wants to shoot on, that’s where I start to have that scratched both from a policy standpoint,” he said. “What’s the rule of order going to be when Hal is out there executing a strike on itself?” he said, referencing the renegade computer than took over a spaceship in the motion picture 2001: A Space Odyssey. “I jokingly look at all of the movies out there and they typically don’t end well when we do that.

“In the next two or three years we’ll probably have a better idea of whether a replacement for the F/A-18E/F will be manned or unmanned,” Harris said. “I believe it most likely will be manned. I’m open to the other aspects of it. A family of systems definitely will include manned and unmanned systems.”

Harris said the development of the MQ-25 “has been very successful,” noting the Boeing prototype has been flying with its aerial refueling store.

He said the MQ-25 will be able to carry fuel for up to three carrier launch and recovery cycles or be able to pass 14,000 to 16,000 pounds of fuel up to 500 nautical miles on a strike mission. It will have some unspecified intelligence, surveillance and reconnaissance capability.

Navy Orders One Additional MQ-4C Triton UAV

An MQ-4C Triton taxis at Andersen Air Force Base. *U.S. AIR FORCE / Senior Airman Michael S. Murphy*

ARLINGTON, Va. – The U.S. Navy has ordered an additional MQ-4C Triton high-altitude, long-endurance unmanned aerial vehicle.

The Naval Air Systems Command has awarded Northrop Grumman Systems Corp. a $98.9 million contract modification to a previously awarded, fixed-priced incentive contract "for one additional low-rate initial production Lot Five MQ-4C Triton unmanned aircraft system," the Defense Department said in a March 26 contract announcement.

The order brings LRIP Lot 5 to three Tritons and, counting orders of the four previous LRIP lots, the Navy has ordered a total of 15. The service plans to procure a total of 68 production Tritons.

The Navy has taken delivery of three LRIP 1 Tritons so far, in addition to its two prototypes used for development and testing.

Last year, the Navy began an Early Operational Capability deployment of the Triton to Guam with a detachment of unmanned Patrol Squadron 19. The Navy plans to deploy three orbits overseas by 2025, and later establish two orbits from bases in the continental United States.

Work on the new order is expected to be completed in January 2025.

Navy Accepts Delivery of First Tomahawk Block 5 Missile

The guided-missile destroyer USS Chafee (DDG 90) launches a Block 5 Tomahawk, the weapon’s newest variant, during a three day missile exercise in November 2020. This event marked the first time a Block 5 Tomahawk missile was operationally

tested, marking the Navy's transition to a more advanced capability for the fleet. *U.S. NAVY / Ens. Sean Ianno/Released*
ARLINGTON, Va.—The U.S. Navy accepted its first Block 5 Tomahawk cruise missile from Raytheon Missiles & Defense in March 25 ceremonies at the company's facility in Tucson, Arizona.

The missile is one of the first five Block 4 Tactical Tomahawk missiles that have been inducted into the recertification process, which takes missiles at the midlife 15-year mark for overhaul, modernization, and re-certification as Block 5 versions.

All Block 5s will feature a new data-link radio and antennas and navigation system. The Block 5a version also will feature a new seeker kit to hit moving targets and will be called the Maritime Strike Tomahawk (MST). The Block 5b version will feature the Joint Multi-Effects Warhead System.

Deliveries of all-new Block 5 missiles will begin in late 2021, said Kim Ernzen, vice president of Naval Power at Raytheon Missiles & Defense, speaking during the ceremonies on Zoom.

Chris Daily, program area director, Naval Air Missiles, for Raytheon Missiles & Defense, said the Tomahawk "remains our "nation's weapon of choice" and that "delivery of the Block 5 is the next evolutionary step for the Tomahawk."

Ernzen noted that the Tomahawk entered service in 1983 and first was used in combat in 1991 during the Persian Gulf War. More that 2,300 Tomahawks have been fired in combat and 500 have been used in test firings. More than 4,000 had been delivered by 2017.

She said the highly survivable Tomahawk is "counted on for its precision" and that Raytheon is "taking existing capability and making it even better."

Capt. John Red, the Navy's Tomahawk Weapon System program manager, also speaking in the event, noted that each Tomahawk now only needs to return to Raytheon's factory only once in the lifecycle of the missile, 15 years after production, for another 15-year life extension.

During the ceremonies, Ernzen and Red signed symbolically the DD250 form signifying the official transfer of the first Block 5 missile.

The Navy ultimately will field only the Block 5 version once the remaining Block 4 Tactical Tomahawks have been converted to Block 5s. The earlier Block 3 versions, which first entered service in 1994, are being withdrawn from use and are being demilitarized.

Navy Orders 10th Block V Virginia-Class Attack Submarine

The U.S. Navy has exercised a contract option for a tenth Block V version of the Virginia-class submarine to join its other Virginia-class subs, including the USS Illinois, shown here preparing to leave Pearl Harbor in 2019. U.S. NAVY / Mass Communication Specialist 1st Class Daniel Hinton

ARLINGTON, Va. – The Navy has exercised a contract option and ordered a tenth Block V version of the Virginia-class nuclear-powered attack submarine (SSN).

The Naval Sea Systems Command awarded General Dynamics Electric Boat a $2.4 billion fixed-price incentive modification to a contract for the SSN, according to a March 19 Defense Department contract announcement. Electric Boat subcontracts Huntington Ingalls Newport News Shipbuilding for part of the work on the program.

This 460-foot, 10,200-ton Block V SSN, like seven of its nine sister Block Vs, will include a Virginia Payload Module, an 84-foot-long section of launch tubes which can fire 28 Tomahawk cruise missiles, in addition to the 12 launch tubes in the submarine's bow, giving the submarine a payload of 40

Tomahawks.

Work on this contract option is expected to be completed by 2030. This SSN will bring to 38 the number of Virginia-class SSNs in the fleet.

Low-Yield Warhead, Nuclear Sea-Based Cruise Missile Will Survive, HASC Ranking Member Says

Chairman of the Joint Chiefs of Staff Gen. Mark A. Milley speaks to Cmdr. Brian Murphy, commanding officer of the Ohio-class ballistic-missile submarine USS Alabama (SSBN 731) Blue

crew, March 3. Milley toured Alabama, visited with Sailors, and toured Trident Training Facility Bangor and Strategic Weapons Facility Pacific while visiting strategic-deterrent units in the Pacific Northwest. *U.S. Navy/ Mass Communication Specialist 1st Class Andrea Perez*

ARLINGTON, Va. – Two naval nuclear weapons deployed or planned are likely to survive cancellation efforts from Democratic members Congress, said the new ranking member of the House Armed Services Committee (HASC).

Mike Rogers, R-Alabama, speaking March 22 during a webinar of the Defense Writers Group, was asked by *Seapower* about the future of the W76-4 low-yield warhead deployed in 2019 on some Trident submarine-launched ballistic missiles – carried on Ohio-class ballistic-missile submarines – and the planned nuclear-armed sea-launched cruise missile (SLCM) called for in the Defense Department's 2018 Nuclear Posture Review.

The NPR said that "a low-yield SLBM warhead and SLCM will not require or rely on host nation support to provide deterrent effect. They will provide additional diversity in platforms, range, and survivability, and a valuable hedge against future nuclear 'break out' scenarios."

The review said the "SLCM will provide a needed non-strategic regional presence, an assured response capability. It also will provide an arms-control-compliant response to Russia's noncompliance with the Intermediate-range Nuclear Forces Treaty, its nonstrategic nuclear arsenal, and its other destabilizing behaviors."

The new HASC chairman, Rep. Adam Smith, D-Washington, has stated his opposition to the low-yield warhead and SLCM as being destabilizing to the nuclear balance.

"We'll hold the line," Rogers said, speaking of the congressional Republicans. "I'm sure there will be a big debate. We've got some people [opponents of weapons], as long as there are TV cameras in the room, they're going to run

their mouth, but I think we'll have the votes."

Congressman Supports Defense Digital Service Academy for Cyber, AI

Rep. Mike Rogers foresees a military academy that focuses on cybersecurity, artificial intelligence and other high-tech skills. NAVAL INFORMATION WARFARE CENTER PACIFIC

ARLINGTON, Va. – The ranking member of the House Armed Services Committee supports establishment of a new training

institution for cyberwarfare and artificial intelligence (AI) to help the nation to meet cyber threats.

Rep. Mike Rogers, R-Alabama, speaking March 22 in a webinar of the Defense Writers Group, said one of his top priorities is developing the nation's defense work force in cyber and artificial intelligence capabilities.

"We just had a cool subcommittee hearing a little over a week ago that recommended a digital service academy, much like the military academies now, but we'd train cyber and AI and other IT [information technology] skills," Rogers said, noting that the academy could offer qualification "anywhere from a certificate level to an associate degree, bachelor's degree, to a doctoral degree."

Rogers said the concept would recruit students that would attend at no charge and would have an obligation to work five years for the government.

"That's something I'm really focused on, because cyber is an emerging threat that we've go to recognize we're not prepared to meet," he said.

Marine Corps to Procure 18 MQ-9 Reapers to 'Close Kill Chain,' General Says

An MQ-9A Reaper assigned to the 556th Test and Evaluation Squadron sits on the ramp at Creech Air Force Base carrying eight Hellfire missiles. *U.S. Air Force / SrA Haley Stevens*

ARLINGTON, Va.—The Marine Corps plans to procure a total of 18 MQ-9A extended range Reaper unmanned aerial vehicles to operate in support of distributed maritime operations and expeditionary base operations, particularly in the Indo-Pacific region.

The Corps currently operates two MQ-9As in the U.S. Central Command area of responsibility. The two are operated by a Marine UAV squadron (VMU).

“We will procure 16 more for a total of 18,” said Lt. Gen. Eric M. Smith, commanding general, Marine Corps Combat Development Command, testifying March 18 before the Seapower and Projection Forces Subcommittee of the House Armed Services Committee. “That’s three [VMU] squadrons of six [each].”

The Reapers — built by General Atomics Aeronautical Systems —

being procured have the Block 5-20 upgrades, which will be updated because of the open architecture of the system and will be able “to keep pace with or outpace the threat,” Smith said, who noted that the Reapers have on board “systems that give both inflight protection and protection from tampering.”

Smith said the Reapers could operate from a variety of locations, including the continental United States, Hawaii, Guam, or a partner nation.

The MQ-9A is incredibly important to us to pass data across the battlefield, the closer of the maritime kill chain as we operate underneath an alternate precision navigation and timing network,” Smith said. “That system has the duration and the range to be operated from those bases that we do control and still give us the loiter time that we need to both close the kill chain and to move that asset around something as vast as the Indo-Pacific theater.”

Earlier, the Corps garnered extensive experience with the Reaper by using ISR (intelligence, surveillance and reconnaissance) services provided by General Atomics in support of Marine forces in Southwest Asia.

Navy’s Future Carrier Air Wing Could Reach 40% Unmanned Aircraft, Use Manned/Unmanned Teaming, Admiral Says

Boeing conducts MQ-25 deck handling demonstration at its facility in St. Louis, Missouri, in 2018. *U.S. Navy / Boeing*

ARLINGTON, Va. – The Navy's forthcoming fielding of its first carrier-based unmanned aircraft could presage a much larger UAS presence in the future carrier air wing, a senior admiral said, and may include manned/unmanned teaming.

The MQ-25A Stingray UAS now being tested by Boeing and the Navy is designed to be a tanker for aerial refueling of other carrier-based aircraft such as the F-35C Lightning II and F/A-18E/F Super Hornet strike fighters; EA-18G Growler electronic attach aircraft; E-2D Advanced Hawkeye battle management aircraft; and CMV-22B Osprey carrier on-board delivery aircraft.

"The MQ-25 has great promise for us," said Vice Adm. James Kilby, deputy chief of naval operations for Warfighting Requirements and Capabilities, testifying March 18 before the Seapower and Projection Forces Subcommittee of the House Armed Services Committee. "Our initial focus is to introduce this platform and get it introduced into the air wing where it can serve its role initially in tanking and limited ISR [intelligence, surveillance and reconnaissance]. But what we

are focusing on is launching, landing, moving it around on the deck, bringing it up, taking it down to the hangar bay, how do we position those assets, how can we support the air wing.

“So, step one: get the fighters out of the business of refueling fighters and use the MQ-25 to do that, initially close aboard the carrier but eventually at range,” Kilby said. “But there is some payload capacity in that vehicle that we think has great promise for us. So, I think initially we would transition to ISR but in an air wing of the future view … we think we could get upwards of 40% of the aircraft in an air wing that are unmanned and then transition beyond that.”

Kilby said the logical step would be, “crawl, walk run, figure how to handle it within the air wing, let’s move to ISR, maybe electronic attack, strike, and then other things as complexity grows across that mission set. The MQ-25 most certainly will provide promise to us because perhaps it would exceed the endurance of a maned aircraft.”

The admiral pointed out that while there will be a control center on each aircraft carrier for unmanned aircraft, the Navy’s aspiration is for manned unmanned teaming in the future so that manned aircraft could control unmanned aircraft.

Navy’s Orca XLUUV to Have Mine-Laying Mission, Adm. Kilby says

Boeing's Echo Voyager, forerunner of the Orca extra-large unmanned underwater vehicle, or XLUUV. *Boeing*

ARLINGTON, Va. — The Navy is planning on mine laying as the initial mission for the Orca extra-large unmanned underwater vehicle (XLUUV), a Navy official said.

"The XLUUV is a migration from the Echo Voyager from Boeing, with a mission module placed in the middle of it, to initially carry mines," said Vice Adm. James Kilby, deputy chief of naval operations for Warfighting Requirements and Capabilities, testifying March 18 before the Seapower and Projection Forces Subcommittee of the House Armed Services Committee. "We are pursuing that vehicle because we have operational needs from a combatant commander to go solve this specific problem."

The Orca, five of which are being built by Boeing, will be an open-architecture, reconfigurable UUV that will be modular in construction and have a modular payload bay. 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 length will be greater than 80 feet. The Orca, too large to be carried by a submarine, will be pier-launched.

“We need to get that initial prototype built and start employing it to see if we can achieve the requirements to do that mission set,” Kilby said. “If we can’t meet our milestones, we need to critically look at that and decide if we have to pursue another model or methodology to get after that combatant need. In the case of the XLUUV, we haven’t even had enough run time of that vessel to make that determination yet. Certainly, there [are] challenges with that vehicle.”

The Navy is developing new types of mines: the cylindrical-shaped Clandestine Delivered Mine and the Hammerhead, an encapsulated torpedo designed to lie in wait for submarines. The capsule for the torpedo would be anchored to the ocean floor, much like the Mk60 CAPTOR mine of Cold War vintage that housed a Mk46 antisubmarine torpedo. (The CAPTOR was withdrawn from the Navy’s inventory in 2001.) The Hammerhead is designed to have modular architecture to allow for technology insertion.