Space: The Next Warfighting Domain



Navy Cmdr. Damon Melidossian said that teamwork among the combatant commands and commercial market will be critical in setting up the planned lower-orbit constellation of satellites. *LISA NIPP* As space continues to emerge as a significantly important

strategic domain, the armed services and industry alike are working together to ensure that the U.S. retains and expands its dominance.

The job at hand entails several key areas, which four experts described at length during a April 4 panel discussion at the Navy League of the United States Sea-Air-Space conference at National Harbor, Maryland.

The work performed by CAES Solutions to improve situational awareness, reduced cycle times and acceleration of technological developments, as described by Gregg Bell of the company's Space Systems Division, would provide support for the identification and kill-chain issues Navy Cmdr. Damon Melidossian of the Defense Department's Space Development Agency described.

"We have a partnership with Lattice Semiconductors, where will bring our radiation-hardened electronics packaging to focus, which is going to be critical for learning in space," Bell said. "We'll be able to further advance some of the world's most critical missions."

Additive manufacturing and artificial intelligence, he added, have enabled the company to deliver solutions quicker than ever before.

Melidossian said that teamwork among the combatant commands and commercial market will be critical in setting up the planned lower-orbit constellation of satellites. When in place, he said, the constellation would reduce latency issues to mere seconds.

"The architecture we're building is done in different layers of satellites, processors and sensors, all to build out this architecture," Melidossian said. "It constitutes initially 20 satellites. What they're going to do is provide speed-of-light data transfer from anywhere on the planet to any warfighting element."

Getting the satellites on orbit and on schedule is "a top priority," Melidossian said.

Ensuring that the preponderance of quick data can be put to good use is a key challenge for the software industry, said Dr. Angel Smith of Microsoft.

"Anywhere you've got multidomain operations, you've got large data sets," said Smith, a former Marine C-130 pilot, who manages mission solutions and customer expansion at Microsoft. "You need to move data fast, and you need to make decisions very quickly. That's where I think the software industry is uniquely postured to be able to [provide] support." Maj. Gen. Ryan Heritage, commander of both the Marine Corps' Forces Cyber Command and Forces Space Command, described how the service's emphasis on space operations is a key contingent of the effort to divest itself of archaic missions and equipment and refocus on elements that would help with the future fight.

"The Marine Corps is changing some of the training for our space staff officers — doubling down on the space operations officers." Heritage said.

During a recent vision to the Marine Corps Air-Ground Combat Center in Twentynine Palms, California, Heritage said he heard officers from all services brainstorm about integrating these new capabilities down to the company level.

"You typically don't associate Marines with space necessarily," Heritage said, "but the personnel are coming."

New Marine occupational specialties are focusing on space and cyber, he added. In time, these Marines will rise into leadership positions.

Working With Allies and Partners Key to Maintaining Deterrence in Indo-Pacific, Speakers Say



Adm. Samuel Paparo, commander of the U.S. Navy's Pacific Fleet, said it's critical to continue to build strong partnerships around the world. *LISA NIPP* NATIONAL HARBOR, Md. – The U.S. military, and its allies and partners, should make sure countries that would upend the international order in regions like the Indo-Pacific pay a steep price so it's not worth the effort, Adm. Samuel Paparo, commander of the U.S. Navy's Pacific Fleet, said April 4.

"Everything that we do must be underpinned by a profound and real capability to bring to bear overwhelming costs that exceed that which can be gained by those who would upend the international rules-based order," he said at a panel on the Indo-Pacific region.

He added that "deterrence is not an activity, but it is an outcome."

Paparo reinforced the importance of allies and partners. A critical line of effort is to continue to build strong partnerships around the world, and these relationships inform the Navy's posture and presence in the Indo-Pacific region, he said.

"There is a saying that we can judge our character by the friends that we keep. And, I along with everyone in this room, are pretty proud of the wide-ranging international solidarity of actors with whom we are allied and partnered," Paparo said. "... It is the fact that our allies and our partners come as they are in accordance with their sovereign desires, in accordance with the international rules-based order, and we find ways that we can team together."

Paparo said the final line of operation and the one that "encompasses all" is the importance of communicating effectively. He said our adversaries must know what our intentions and what our capabilities are to build that deterrent force.

"We must be aligned along with our allies and partners, and then the American people who support us with their hard work every day, who pay the bills for the security and the wellbeing that the joint force and all of government delivers, must know what we're doing," Paparo said.

Vice Adm. Michael F. McAllister, commander of Pacific Area and

U.S. Coast Guard Defense Force West, said the Coast Guard's role underscores Paparo's emphasis on the importance of partnerships in and around the Indo-Pacific region. He said the Coast Guard has worked successfully to contribute to regional stability and security.

"While we are a military organization, we also act as a civilian organization, we are law enforcement authorities, regulatory authorities, and, we are good at disaster response," McAllister said. "The types of activities that would be familiar are capacity building in the region, joint operations, shared education and training, [and] information sharing, particularly in the unclassified realm, which allows us to engage with more partners. But we are really big on trying to build those bilateral and multilateral relationships that build confidence and capacity for regions in the nation to be able to exert sovereignty in their waters as best they can."

Representing the State Department on the panel, Camille P. Dawson, deputy assistant secretary, Office of Public Affairs and Public Diplomacy, said the recently-released Indo-Pacific Strategy is the Administration's policy that lays out the U.S. vision for the region. That is a vision of "a free and open Indo-Pacific that is connected, prosperous, secure and resilient," she said.

Dawson said the State Department plays a fundamental role in the implementation of virtually every aspect of the Indo-Pacfiic Strategy. She described the five key pillars of the plan, which are to advance freedom and openness; build collective capacity within and beyond the region; promote shared prosperity; bolster Indo-Pacific security; and, build regional resilience.

Navy's MQ-4C Triton UAV Back on Track With New Capability, Planned Orders



A model of the MQ-4C Triton at Northrop Grumman's booth. *Seapower*

NATIONAL HARBOR, Md. – The Navy's MQ-4C Triton high-altitude, long-endurance unmanned aerial vehicle is on track for initial operational capability with the new Integrated Functional Capability 4 (IFC-4) with a full orbit of four aircraft in fiscal 2023, a senior official said.

Speaking April 4 to reporters in a roundtable at the Navy League's Sea-Air Space expo, Rear Adm. Brian Corey, program executive officer for Unmanned and Strike Weapons, said IFC-4, which began flight testing in February, will give the Triton – built by Northrop Grumman (Booth 1300, Dock Space 2) – the capabilities needed to reach IOC and begin to replace the EP-3E Orion maritime reconnaissance aircraft.

The Navy has had the MQ-4C with the baseline IFC-3 capability deployed in 2020 to the Western Pacific in an early operational capability. One aircraft assigned to Unmanned Patrol Squadron (VUP-19) remains deployed while a second has returned to the United States to give maintenance personnel more hands-on experience.

Corey said with IFC-3 "the Navy was not ready to get the network right. We weren't allowed to connect to the network. We've come a long way to an operationally relevant environment."

The number of planned regional orbits for the Triton originally was planned to be five, with four aircraft each. Beyond the first orbit, the future location and structure of the orbits is less defined and will be determined with regional combatant commander input.

The Navy paused planned procurement of the MQ-4C for two years in 2021 and 2022, but the production line was sustained with an order of three Tritons for Australia and one for the U.S. Navy added in 2021 by Congress, followed by another congressional addition in 2022. The Navy has requested procurement of three Tritons for fiscal 2023.

VUP-19, headquartered at Naval Air Station Jacksonville, Florida, moved its maintenance detachment to nearby Naval Station Mayport, Florida, last year from NAS Point Mugu, California. The future of Point Mugu as a future Triton base is yet to be determined. The second squadron, VUP-11, will be based at NAS Whidbey Island, Washington, but the location of its Tritons there or at Point Mugu or elsewhere will be decided later.

The EP-3E aircraft has a large crew of signals intelligence analysts, and the Triton IFC-4 represents a significant change in the analysis, with onboard processing largely replaced by a wide distribution of the intelligence information across many sites of the intelligence community, Corey said.

Corey said the RQ-4A Global Hawk Broad-Area Maritime Surveillance — Demonstration aircraft which have supported the U.S. 5th Fleet since 2009, remain in service, with Congress having funded the BAMS-D for 2022 despite the Navy's plan to divest it. The Navy again in the 2023 budget request targets the BAMS-D for retirement, with budget pressures overcoming the utility of the aircraft.

Defense Official: U.S. Needs to Improve Engagement With Industry, International Allies



Gabriel Perez Garces, second from left, makes a point during the Global Maritime Leadership panel on April 4. *LISA NIPP* NATIONAL HARBOR, Md. – A defense official says the U.S. government needs to improve the way it works with both the defense industry and international allies to ensure U.S. allies are getting the military equipment they need.

Jed Royal, deputy director of the Defense Security Cooperation Agency, said during a panel discussion on global maritime leadership that the defense industry looks to the U.S. military as the primary customer, "as they should," but that often means that allies and partners of the United States don't get the prioritization for defense assets that they need.

The United States needs to find a way to take into account an ally's needs early in the process, rather than waiting for when there's a specific demand for missiles, aircraft, or some other defense industry product, Royal said.

"We need to think more creatively up front," he said. "What I'm referring to here is a higher level of conversation both with allies and partners and with industry." Royal said it is not ideal for the defense industry to wait for the demand signal, and instead the conversation must be held well in advance of those needs arising — which in turn serves U.S. interests by ensuring strong allies, he said.

Also, while Royal argues that the United States is superior to its adversaries in terms of better systems, "where we are less competitive is how we manage our partners' finances," he said. "We are losing some opportunity for collective security interest by not being able to advance better terms and conditions for the purchase of U.S. equipment, so we need to be rethinking that."

Finally, the United States also needs to think about developing capabilities that are better suited for allies' requirements, Royal argued. The United States often buys heavy assets with long tails in sustainment, but that may not suit the needs of allies and partners, and so that needs to be factored in, he said.

"We need to establish investment opportunities and rhythms and habits of making sure the priorities of our allies and partners are at the [right] level," he said.

Outdoor and Dock Exhibitors Offer Whatever Floats Your Boat



The M-80 Stiletto floating maritime experimentation platform in National Harbor. *SOLARES PHOTOGRAPHY* NATIONAL HARBOR, Md. – From a Stiletto to a Rekognition Video Analyzer, outdoor and dock exhibitors are giving Sea-Air-Space attendees the opportunity to check out cutting-edge defense technology.

The carbon-fiber, 88-foot M-80 Stiletto is a floating platform devoted to maritime experimentation, with the goal of supporting the Joint Forces in countering emerging threats. Operated by Joint Prototyping & Experimentation Maritime, Stiletto allows its customers to evaluate and refine their technologies in realistic environments, using representative threats in tactics-based scenarios.

Stiletto tests about 60 to 65 different technologies every year, and more than half of its customers are small businesses, said Dennis Danko, JPEM-Stiletto joint prototyping maritime programming manager.

"We foster commercial innovation by giving small businesses

and nontraditional system developers an opportunity to experiment on the water and gain a deep understanding of military missions and maritime operations," he said.

Stiletto has the capability of working a few feet or hundreds of miles off the coast, and carries its own 11-meter rigid inflatable boat. It can also launch drones and other unmanned systems from its flight deck.

Danko said Stiletto has tested radar and cybersecurity technologies, network systems and even ergonomic seats for boats. It conducts environmental vulnerability assessments for technology systems and engineering evaluations, including various coatings to prevent marine growth.

The Rekognition Video Analyzer is part of a partnership between Amazon Web Services, Viasat and Federated Wireless.

The Viasat system can detect objects from water, piers, docks, land vehicles, paths and even clothing or other apparel, said Steve Conklin of Viasat. Amazon's Rekognition system analyzes the data, protecting text, data and other communications. Federated Wireless provides secure 5G encryption and protection.

"We can set up in any kind of edge location or disaster environment," Conklin said, noting that two weeks ago, the system was operational in Poland, on the front lines of the Ukraine conflict.

On Tuesday, April 5, L3Harris Technologies will give tours and rides from the dock on its autonomous boat to showcase its C5ISR-T technology.

Admiral: Navy Actively Experimenting With Cargo UAS Between Ships



Rear Adm. Brian Corey, program executive officer for unmanned and weapons, discusses Navy UAS. *SOLARES PHOTOGRAPHY* NATIONAL HARBOR, Md. – The Navy has been conducting flights between ships as part of an effort to experiment with a cargo unmanned aerial system for maritime use.

Recently, the Navy used an aerial vehicle to transport a part 200 miles between ships, said Rear Adm. Brian Corey, program executive officer for unmanned and weapons (PEO-U&W) at Naval Air Systems Command, during an address at the Navy League's Sea-Air-Space symposium.

"That's going to continue," Corey said of the experiments, while noting that the question of when it could be fielded was up to Navy leadership. "It's not a technology question, but there are some engineering choices and some work left to be done."

The program has partnered with both the Navy and Military Sealift Command on the effort to demonstrate the capability to transport small parts ship to ship.

"We believe we could deliver those 200 miles with a relatively small, very inexpensive vehicle," Corey said. "So that's what we're trying to do to enable that is to get the networks and interoperability down and get a small family of ground systems or maybe a single one – that's unknown at this stage. And then how can we get the autonomous takeoff and landing?"

In a separate effort, the program is experimenting with a cargo UAS for the Marine Corps.

"It's not yet come to a spot where we have decided to go forward with a program and field it," Corey said of the Tactical Resupply Unmanned Aircraft System. "The decision will be coming before long depending on how well it works in the field."

There are some clear advantages to such a system, he said.

"I think that's some of the most innovative thinking we have going on right now," he said. "Why drive down a road and potentially get an IED [improvised explosive device] ... when you can fly?"

Navy's AARGM-ER Missile

Tracking Toward 2023 IOC



The Navy's Advanced Anti-Radiation Guided Missile-Extended Range (AARGM-ER) completes its first live fire event July 19 off the coast of Point Mugu Sea Test Range in California. U.S. NAVY

NATIONAL HARBOR, Md.— The Navy's Advanced Anti-Radiation Guided Missile-Extended Range (AARGM-ER) is tracking toward an initial operational capability of the fourth quarter of fiscal 2023, the Navy program manager said.

The Northrop Grumman-built AGM-84G AARGM-ER is a growth of the baseline AARGM, the AGM-84E. The improved missile, built to suppress or destroy enemy air defenses, includes a new, larger airframe housing a new solid rocket motor, a new warhead, tail control surfaces and a new control actuation system for more maneuverability, increased range and improved survivability.

The AARGM-ER is being developed to arm the F/A-8E/F Super Hornet strike fighter, the EA-18G electronic attack aircraft and the F-35 Lightning II strike fighter.

Speaking April 4 to reporters at the Navy League's Sea-Air Space expo at National Harbor, Maryland, Capt. Alex Dutko, the program manager, also said operational testing is continuing this year and is expected to be completed in fiscal 2023, with IOC slated for the fourth quarter. Full-rate production is planned for fiscal 2025.

The AARGM-ER entered low-rate initial production during the fourth quarter of 2021, the first of two LRIP lots. The first developmental test flight was conducted in late fiscal 2021 followed by a second test flight in February 2022. A third developmental test flight will be scheduled before operational test begins.

Doug Larratt, Northrop Grumman's AARGM-ER program director, also briefing reporters, said the production of the baseline AARGM is winding down, with deliveries continuing through fiscal 2024 to support transition to the ER version.

He said Northrop Grumman has delivered more than 11,400 AARGMs (including training missiles and spares) so far out of a program of record of 1,803 baseline AARGMs.

SAIC Partners to Promote Loitering Munition, Underwater Comms System



The UVision Hero 400-EC loitering munition, which SAIC is helping develop to meet U.S. Navy requirements. *LISA NIPP* NATIONAL HARBOR, Md. – SAIC (Booth 801) is working with partners on weapons systems it says are of great interest to the U.S. Navy and other militaries: a loitering munition, such as those that have seen action in Ukraine, and an underwater communication system flexible enough to let divers control unmanned aircraft.

One is the Hero 400-EC long-endurance loitering munition system, originally developed by Israel's UVision. The canister-launched system could carry a variety of payloads, including munitions and has an endurance of up to two hours.

"We help them bring overseas technology that perhaps meets the requirements of DoD, and we take that technology, we Americanize it and then offer it up to DoD to meet their requirements," said Bob Carruthers, vice president of SAIC's Charleston Naval Business Unit in North Carolina.

UVision won a Marine Corps contract for a smaller version of

the Hero. The Navy is developing requirements for a larger loitering munition for use on ships such as destroyers and cruisers, for which the 400 could contend, Carruthers said.

On the underwater side, SAIC is working with Mistral Inc. on the C-Master MKII and Orca, "a covert underwater communication system," said Peter J. Brown of SAIC's Industrial Manufacturing & Systems Engineering.

As many as 15 divers could share their locations and communicate underwater using the system's small antenna, and could even launch small unmanned aircraft and control drones or loitering munitions from underwater without the antenna having to break the surface.

"You can see 15 other divers on that screen, up to 3 kilometers away, underwater, using low intercept probability acoustic signatures, and at the same time you could potentially control a UAV, get the feed and control a terminal munition," Carruthers said.

Brown said the system has been tested in prototype form with other navies and U.S. SEALs have had a look at it as well and provided feedback.

Russia is Acute Threat, China is Priority Threat, Speakers Say



Brig. Gen. Sean Salene called the United States a "Pacific nation." *LISA NIPP* NATIONAL HARBOR, Md. — The U.S. Defense Department will continue to have a priority focus on China despite the global military community's recent attention to the war in Ukraine, said Elbridge "Bridge" Colby, a former U.S. deputy assistant secretary of defense for strategy and force development, in a one-on-one April 4 discussion with U.S. Marine Corps Brig. Gen. Sean Salene.

"The China problem remains very grave," said Colby. "In a lot of respects, this to me is really going to be the core of the defense strategy going forward. We see China continue to be named as the priority challenge. China is the long-term challenge, and the only one that can challenge the United States and our interests in a really sustaining and global way."

As he prepared to introduce Salene, Colby posited questions about the concept of integrated deterrence, and asked whether the U.S. will prioritize the Indo-Pacific region and over what time period. Overall, he said the U.S. needs a sustainable Indo-Pacific strategy and must carefully consider the nature of its alliances and partnerships in the region. He said the United States must work to fully understand how to deal, for example, with countries like India, which may have a different perspective on Russia than does the U.S.

"What does it mean that Russia is an acute threat whereas China is the priority threat? How are we going to go about doing that? Or do we need to prioritize at all? Some people are saying maybe we double the defense budget and you get out of prioritization," Colby said.

Salene, the director of the Strategy and Plans Division, Plans, Policies and Operations at Marine Corps Headquarters, said there are four overarching priorities in the National Defense Strategy, among them "first and foremost" to defend the homeland. Other priorities include deterring a strategic attack against the United States and against its allies and partners; deterring aggression from China, particularly in the Indo-Pacific, and then against the Russia challenge in Europe; and building a resilient joint force and the ecosystem that supports it inside the defense establishment.

Salene said the Indo-Pacific region is critically important to the U.S. and its partners and allies, and the U.S. is committed to helping its allies defend their own sovereignty.

"We are a Pacific nation," Salene said. "You probably know how much trade goes though there. You probably know the value and the rise of Asia, and what it means to the development of the entire world."

He said the most important themes going forward involve the key strategic advantages of working with allies and partners, and the "integrated nature at which we would apply all of the elements of our national power," also known as integrated deterrence.

More Than 50 Employers Discuss Civilian Transitions at Job Fair



Yonny Dublinsky of Boeing talks with Staff Sgt. Abigail Scott about possible job opportunities after the military at the Transition Connection job fair. SOLARES PHOTOGRAPHY NATIONAL HARBOR, Md. – Navy Lt. j.g. Jen Fishbein is in transition. She has a baby due in August, she's studying for a master's degree in executive public management and she's scheduled to separate from the military in two years – so, it made sense that she was visiting the Transition Connection Job Fair Monday afternoon.

The second annual Sea-Air-Space hiring event focused on

providing job opportunities to members of the military and their families. More than 50 employers offered information and advice to attendees who were investigating civilian careers.

"I want to see what's out there if I were to get out of the military," says Fishbein, who currently works at the National Reconnaissance Office. "I'm looking at where life can take me."

Marine Sgt. Owen Budd was also taking a proactive approach to his post-military career. He's separating in 2023, but he's already looking to the future. He's studying for an undergraduate degree in sports and health science at the American Military University, and hopes to parlay his work in human resources with the Marine Corps Embassy Security Group into a civilian career.

Budd was interested in ClearanceJobs, the country's largest career network for professionals with U.S. federal government security clearances. ClearanceJobs' online networking platform lists more than 60,000 defense and intelligence jobs, along with free advice on military transitions and services like resume-building templates.

"We have over 1 million users who can connect with prescreened employers and communicate directly with recruiters," said Katie Keller, ClearanceJobs editor. "We've served the cleared community since 2002."

Other exhibitors included the Penn State University Applied Research Laboratory, a Navy University Affiliated Research Center focusing on defense science, systems and technologies.

Many of the laboratory employees are ex-military or their spouses. "They understand what we do," said laboratory representative Tina Kephart.

Northern Virginia also had a presence at the Transition Connection Job Fair. The Fairfax County Economic Development Authority recruits military veterans for careers at a variety of employers, said representative Rod Williams. There are over 90,000 job listings available at workinnothernvirginia.com, with a median salary of \$115,000 per job, he said.

Some of those jobs are in air traffic control, which appeals to Staff Sgt. Abigail Scott. Scott, who has been with the Marines for seven years and works as an air defense controller at the Marine Corps Embassy Security Group. Her service doesn't end until January 2024, but she was at the Transition Connection Job Fair as part of her post-military networking strategy.

"I'm looking for a career where I can transfer my skills in security and air traffic control," said Scott, who has provided physical security at U.S. embassies in Kazakhstan and the Central African Republic.