COVID, War in Ukraine Complicate Global Supply Chain, Speakers Say

Maj. Gen. David Maxwell, vice director of logistics, Joint Staff, U.S. Marine Corps, speaks during a panel discussion on the global supply chain. *LISA NIPP*

NATIONAL HARBOR, Md. — The global shipping network is extremely fragile in the wake of the COVID pandemic and the war in Ukraine, speakers on a panel about supply chain logistics said April 6.

Maj. Gen. David Maxwell, vice director of Logistics, Joint Staff, U.S. Marine Corps, said current Navy and Joint Staff operations are focused largely on the Ukraine crisis and "the distribution side of the house," while also addressing broader challenges.

"Over the last month and a half, what you see is U.S.

TRANSCOM's [U.S. Transportation Command's] ability to leverage really both the military capacity and capability that we have, as well as significant support from the commercial industry in being able to both deploy forces in a very dynamic, responsive time, but also to deliver material in support of Ukraine and the nation's efforts to sustain the Ukrainian forces," Maxwell said.

"As we have been spending that time delivering the forces, posturing them, as well as delivering material, [we are] stepping back into the next part of the question, which is, where do we reconstitute? How quickly can we reconstitute supplies and materials that not only have been drawn down out of Department of Defense resources but also that have been drawn down from partners and allies who have contributed? And how quickly and effectively and efficiently can we get back and reconstitute those materials for those partners and allies and U.S. forces?"

Kurt Wendelken, vice commander of Naval Supply Systems, said the military faces the same distribution issues as the commercial world, but the products are very different.

"A lot of these systems that we operate are built for us by key partners, and they are very complex pieces of equipment," Wendelken said. "Although we did get an education in supply chain during COVID about its general fragility, the products that we're dealing with are very complicated. They are not shampoo, they are not Snickers, they are not things from Amazon. [For] partners like [Lockheed Martin], it can take them a year to two years to go make those things for us, and that is assuming they understand what our demand signal is."

Abby Lilly, vice president of global supply chain at Lockheed Martin Rotary and Mission Systems, said human capital is also a big concern. In recent months, she said, there has been a 15% to 20% turnover in some companies that support Lockheed Martin.

"Those companies are struggling to hire new workers to train them to do what we need to do," Lilly said. "Labor availability is one of the key things that we are concerned about. If you think about the great resignation that has happened in this country in the last several months and the number of people who have left the workforce, that is affecting the defense industrial base."

NAVSEA Office Seeks to More Rapidly Modernize Ship Technology Through Common Hardware: Official

Damage Controlman Fireman Abigail Alejo performs a maintenance check aboard amphibious assault ship USS Tripoli (LHA 7), April 1. *U.S. NAVY / Mass Communication Specialist 3rd Class Sebastian Minshall*

NATIONAL HARBOR, Md. — A Naval Sea Systems Command office is seeking to more rapidly modernize ships through a common hardware effort that would make software upgrades easier, an official told attendees at the Navy League's annual Sea-Air-Space symposium April 6.

Ryan Moore, deputy major program manager, said in a briefing on integrated combat systems that his team has focused on the issue of ship hardware and how to ensure commonality across ship classes to better speed technology upgrades to the fleet.

"We're trying to field hardware on the ships that is common rather than different for each variant," Moore said. "We want to deliver a common hardware suite that's a system that can be rapidly updated. We're doing so by creating a common cabinet and leveraging common software licenses."

Moore said the Navy is trying to get away from the practice of using major ship availabilities to make hardware upgrades and "cutting holes in the ships." Instead, his office is working toward a different approach in which the hardware has modules that can be changed.

"We're able to shorten up installation timelines," he said. "We can rapidly go and update these components. … It allows us to go off and address any issues that come up from a hardware perspective."

So, for example, if a ship has an outdated server that became obsolete, and a newer, more advanced server is now available, the team can install the new server because the hardware has been decoupled from the software.

"You don't have to do a form-fit-function redesign," Moore said. "That's the goal here: being able to rapidly modernize

respective platforms."

Sea Services Reach Tipping Point in Maintaining Readiness While Recapitalizing Forces

A Boeing unmanned MQ-25 aircraft is given operating directions on the flight deck aboard the aircraft carrier USS George H.W. Bush (CVN 77) in late 2021. *U.S. NAVY / Mass Communication Specialist 3rd Class Hillary Becke*

NATIONAL HARBOR, Md. — This year's Sea/Air/Space conference occurred at a critical time for the sea services as they

confront strategic rivals in multiple geographic areas and warfare domains.

Aging force structure in all three sea services makes in harder to deter aggression. New technologies and concepts offer the naval services tools to improve their ability to deter and to defend and defeat opponents as needed. In addition, the Navy faces significant financial hurdles in recapitalizing the undersea component of the nuclear deterrent in the Columbia-class ballistic missile submarine while at the same time trying to build a new force for 21st century missions.

The challenge is to maintain the readiness of existing, legacy forces while both recapitalizing existing capabilities, and transitioning to future forces. These new force structure components are likely to include more unmanned units, connected within robust networks capable of fighting and winning inside opponent-imposed limitations such as anti-access/area denial bubbles.

Aging Force Structure

Many of the sea service's existing platforms and systems date from the late Cold War and the 1990s. They have seen extensive service in the first Gulf War, operations in the Balkans in the 1990s, and since 2001 in combating rogue states and violent extremists in Iraq, Afghanistan and around the globe. Limited defense budgets have forced the postponement of needed maintenance between deployments.

Like aging automobiles that do not get serviced at the dealer garage when needed, many ships, aircraft and submarines have equipment problems that prevent them from accomplishing their missions. Famous Cold War-era ship classes like Ticonderoga—class Aegis cruisers, Los Angeles—class nuclear attack submarines, many of the Navy's amphibious warfare ships and even the earlier units of the post-Cold War Arleigh

Burke–class destroyers are approaching and, in some cases, have exceeded their planned service lives. Keeping these aging units on the front lines of global deterrence imposes additional costs on the services and the taxpayers. Like the aging automobile, these costs soon come to outweigh the utility of keeping these ships in commission.

Active Adversaries

Across the period of the post-Cold War era (1991 to the present) U.S. adversaries have not been idle in analyzing U.S. capabilities and fielding platforms and payloads to combat them. Both the People's Republic of China and Russian Federation have watched and learned from U.S. joint force operations of the last 30 years. The PRC remains the "pacing threat" and now fields a fleet of over 350 combatants, along with numerous coastal and maritime militia forces. The PRC also has an extensive force of land-based cruise and ballistic missiles, aircraft and sensors that threaten U.S. forces thousands of miles from the Chinese coast.

The Russian Federation has been unable to modernize its forces as planned ands suffers from severe planning and logistics shortfalls as evidenced by its botched and bogged-down invasion of Ukraine. The Russian navy submarine force, however, while much smaller than its Cold War Soviet equivalent contains a new generation of very quiet submarines including the Borei–class SSBN, the Yasen–class guided missile submarine armed with Kaliber cruise missiles and several special purpose submersibles that could cut seabed cables and otherwise harm underwater infrastructure.

Like a submersible version of the German World War II battleship Bismarck, Russian submarines like the Yasencan threaten multiple targets at sea and ashore. In addition to China and Russia, North Korea continues to menace its neighbors with both conventional and now nuclear weapons while Iran contributes to instability in the Middle East with its

regime's Revolutionary Guard Corps that harasses shipping, fires random missiles and threatens mine laying operations in the key Strait of Hormuz through which most Middle East oil moves to global customers.

Violent extremists, while beaten back in many areas, remain a threat and like the Houthis in Yemen field increasingly effective weapons, including cruise missiles. The overall threat environment to the U.S. sea services is likely higher than at any point since the end of the Cold War.

Path to the Future

The U.S. sea services have equally done hard thinking on current and future threats and are building a path to future joint force far more capable than present, legacy platforms. Unmanned systems technology is spiral developing at a dizzying rate with both small and medium unmanned surface and small unmanned underwater units now available for intelligence, surveillance and reconnaissance missions. The Navy will soon field the MQ-25A Stingray unmanned tanker aircraft, substantially improving the range of carrier-based aircraft.

The Marine Corps plans to use many unmanned systems in support of its new littoral regiments and the Coast Guard also plans to use more unmanned systems. These and new manned ships including the Constellation-class frigates, DDG-X, light amphibious warship and others provide a path toward a larger, 500-ship Navy with both manned and unmanned units to better deter and if necessary, defeat opponents in multiple warfare domains.

Team Effort

The move to a future force of capable manned and unmanned naval forces requires a team effort of civilian policy officials, military officers and industry to reach the goals articulated by Navy Chief of Naval Operations Adm. Mike Gilday, Marine Corps Commandant Gen. David Berger and Coast

Guard Commandant Adm. Karl Schultz for their respective services and for the joint force overall.

The sea services must move from current, costly legacy forces toward a new combination of manned and unmanned surface, subsurface, air and expeditionary units capable of meeting the challenges of the 21st century.

Official: Dahlgren Recently Tested 'Hypercone' Hypersonic Test Projectile

Aerospace engineer Adam Jones said the Navy wants to use Hypercone to gather data to benchmark Naval Surface Warfare Center Dahlgren Division's modeling and simulation

capabilities. *LISA NIPP*
NATIONAL HARBOR, Md. — The Navy continues to work on a conical projectile called Hypercone as it tests hypersonic capabilities, an official told attendees at Sea-Air-Space 2022 on April 6.

Adam Jones, aerospace engineer at Naval Surface Warfare Center Dahlgren Division (NSWCDD), said he couldn't provide any details on the Hypercone firing at White Sands Missile Range in the New Mexico desert.

"Our goal is to provide another opportunity to provide testing," Jones said. "We know that just across the board there are challenges in aero thermal and aero sciences across the board. And we want to use this as a platform to gather the data that we need to help continue to benchmark our modeling and simulation capabilities."

The Navy has not revealed much about the Hypercone effort, part of a larger push for advancing hypersonic technology. In an October 2021 statement, NSWCDD described the purpose of the technology.

"Dahlgren is applying its deep knowledge of advanced gun systems, guided projectiles, and telemetry to support hypersonic research and development," the statement reads. "For example, scientists and engineers are developing advanced guidance and control for future hypersonic systems. NSWCDD recently conducted the first of several planned tests by launching a conical projectile, dubbed Hypercone, to collect aerodynamic and aerothermal data relevant to hypersonic flight conditions.

"Dahlgren also has multiple efforts focused on accurately modeling the flow around a hypersonic vehicle," the statement adds. "Recently, Dahlgren's hypersonic efforts have expanded to include roles in the development of offensive missile boost-glide weapons and other collaborative efforts across the

DoD."

Asked whether Hypercone could be turned into an offensive weapon, Jones declined to say.

Textron Offers King Air 260 for Navy's Multi-Engine Training Aircraft

Marine 1st Lt. Matthew Reith performs a preflight inspection of a Navy T-44C Pegasus training aircraft on the flightline at Naval Air Station Corpus Christi, Texas. *U.S. MARINE CORPS / 1st Lt. Pawel Puczko*

NATIONAL HARBOR, Md. — Textron Aviation is offering a version of its King Air 260 business twin turboprop aircraft to the U.S Navy as a replacement for the service's Beech T-44C training aircraft, a company official said.

Brett Pierson, Textron Aviation Defense's vice president for sales and strategy, told *Seapower* April 6 that the King Air 260 could be modified to meet the requirement for the Multi-Engine Training System (METS), including an aircraft with a high angle-of-attack capability.

Pilots being trained for the E-2 aircraft require such a requirement for training for carrier landings.

The Navy's 2023 budget proposes the procurement of 10 METS, with a total of 58 in a three-year run.

According to a draft request for information posted May 26, 2020, the Navy is looking at existing twin-engine aircraft to replace the service's fleet of 54 T-44Cs used to train Navy, Marine Corps, and Coast Guard pilots to fly aircraft such as the V-22 Osprey, E-2C/D Hawkeye, P-8 Poseidon, P-3 and EP-3 Orion, C-130/KC-130/HC-130 Hercules, E-6 Mercury, C-40 Clipper, HC-27 Spartan and HC-144 Ocean Sentry.

The T-44A, a variant of the Beech King Air 90 business aircraft, first entered service in 1980. The existing T-44As all have been modified to the T-44C configuration.

The Navy said the METS should have an FAA type certification for single- and dual-pilot operations under day and night visual flight rules and under instrument flight rules. It shall cruise at speeds greater or equal to 195 knots and shall be able to operate at a minimum of 20,000 feet above sea level. The aircraft also should have an endurance of 3.5 or more flight hours.

The pressurized aircraft cockpit will have side-by-side seating, as well as a jump seat for an instructor. The cockpit will be equipped with multifunction displays with digital moving map; redundant VHF and UHF radios; an integrated GPS/inertial navigation system; Automatic Dependent Surveillance-Broadcast; flight management system; weather radar, radar altimeter, and a cockpit data recorder.

The METS aircraft also shall have tricycle landing gear and a reconfigurable cargo bay in the cabin.

Pierson said the basic King Air is very close to what the requirements are.

Textron also builds the UC-12W operational support aircraft, a variant of the King Air 350, for the Marine Corps. The company also built the Navy's T-6A/B Texan II single-engine training aircraft. Beech and Cessna are now brand names for some of Textron Aviation's products.

Naval Air Warfare Centers Have 'Sense of Urgency' to Field Improvements

U.S. Navy's Blue Water logistics Unmanned Aerial System, from the Naval Air Warfare Center Aircraft Division's UX-24 Unmanned Test Squadron, takes off from the flight deck of Military Sealift Command's fleet replenishment oiler USNS Joshua Humphreys (T-AO 188) while the ship was at sea in the Atlantic Ocean, July 16. This UAS flight proved the feasibility of using unmanned aircraft to transport small payloads of cargo from one ship to another while operating in a maritime environment. *U.S. NAVY / Bill Mesta*

NATIONAL HARBOR, Md. — In an era when the defense acquisition process often appears ponderous and painfully slow, the Naval Air Warfare Centers have a "sense of urgency" and, the organization, talents and authorities to move needed improvements to naval aircraft and systems from concept to fielding in a fraction of the expected time. That speed of achievement is a weapon of war," Jerry Swift, director AIRWorks, a division of the Naval Air Warfare Center Aircraft Division (NAWCAD), said April 6.

The network of NAWCs can move quicker than the standard

acquisition process due to the ability to quickly scan commercially available technologies, work with industrial partners on acquiring needed components, and internally performing rapid prototyping and testing, Swift said in a briefing at Sea-Air-Space 2022. And it has authorities Congress provided in acquisition reforms to execute that accelerated process, he said.

The NAWCs do not produce aircraft, but they assess the capabilities of those platforms, identify gaps and then move rapidly to find, test and field the needed improvements, Swift said. He offered the example of meeting the need of a blue water logistic program for a small unmanned aircraft with vertical takeoff and landing capability with a 50-pound payload. They screened the available systems, quickly trim the list and within a year conducted shore-to-ship, then ship-to-ship ability and fielded the system in less than the normal multi-year time frame, he said.

He also listed similarly rapid development and fielding of a way to install a number of anti-mine technologies into a pod that is now being deployed on the MQ-8C Fire Scout UAV, and a gunner's seat for the MH-60 helicopters that reduced the gunner's back problems on long missions and could withstand the impact of a hard landing. That seat is now fielded in the entire MH-60 fleet, he said.

The centers' work is guided by the demands from NAWCAD commander Rear Adm. John Lemmon, to install a "sense of urgency," and from Vice Adm. Carl Chebi, commander of Naval Air Systems Command.

"We're here to make sure that Navy and Marine Corps aviation remains relevant," he said.

Northrop Grumman Laser Weapon System Completes Deployment on USS Portland

Amphibious transport dock USS Portland (LPD 27) transits the Gulf of Aden, Dec. 13, with a Solid State Laser — Technology Maturation Laser Weapons System Demonstrator Mark 2 MOD 0 on board. The Office of Naval Research selected Portland to host the laser weapon technology in 2018. *U.S. MARINE CORPS / Lance Cpl. Patrick Katz*

NATIONAL HARBOR, Md. — The Laser Weapon System Demonstrator deployed on the U.S. Navy's amphibious platform dock ship USS Portland (LPD 27) has competed its first deployment as the Portland returned to its homeport of San Diego in March.

Donna Howland, Northrop Grumman's acting business development director for Directed Energy and program manager Laser Weapon System — Demonstrator, told *Seapower* April 6 the Navy said it was "able to exercise the high-energy laser in the 5th Fleet

in December 2021."

The single LWSD was installed on Portland in October 2019 and was first lit-off in December 2019. The Portland deployed for the Indo-Pacific and Central Command areas of responsibility in August 2021.

The 150-kilowatt LWSD is mounted on the superstructure of the Portland and is integrated with the ship's combat information center, where a control console is installed. Northrop Grumman made the Tactical Laser Core Module of the system, while the U.S. government made the system's energy and thermal storage modules.

Northrop Grumman continues to provide test and sustainment support for the LWSD, for which it is under contract through fiscal 2022, Howland said, who noted that the company is working on a follow-on sustainment contract.

During the deployment on the Portland, the LWSD was operated and maintained completely by Sailors. No company employees were on board to support the system. The company provided training on the system before the deployment and developed a three-volume operation and maintenance manual for Sailors to use on the ship, she said.

Howland said the company is looking forward to working with the Office of Naval Research to provide next-generation directed energy systems.

"We are excited about the MOSA [Modular Open System Architecture] that the Navy is looking at," she said. "We really are a proponent of this as we believe it will improve the health of the supply chain and base to support directed energy as we move these systems from science fiction to science fact."

Open-Source Data Brings Challenge and Opportunity
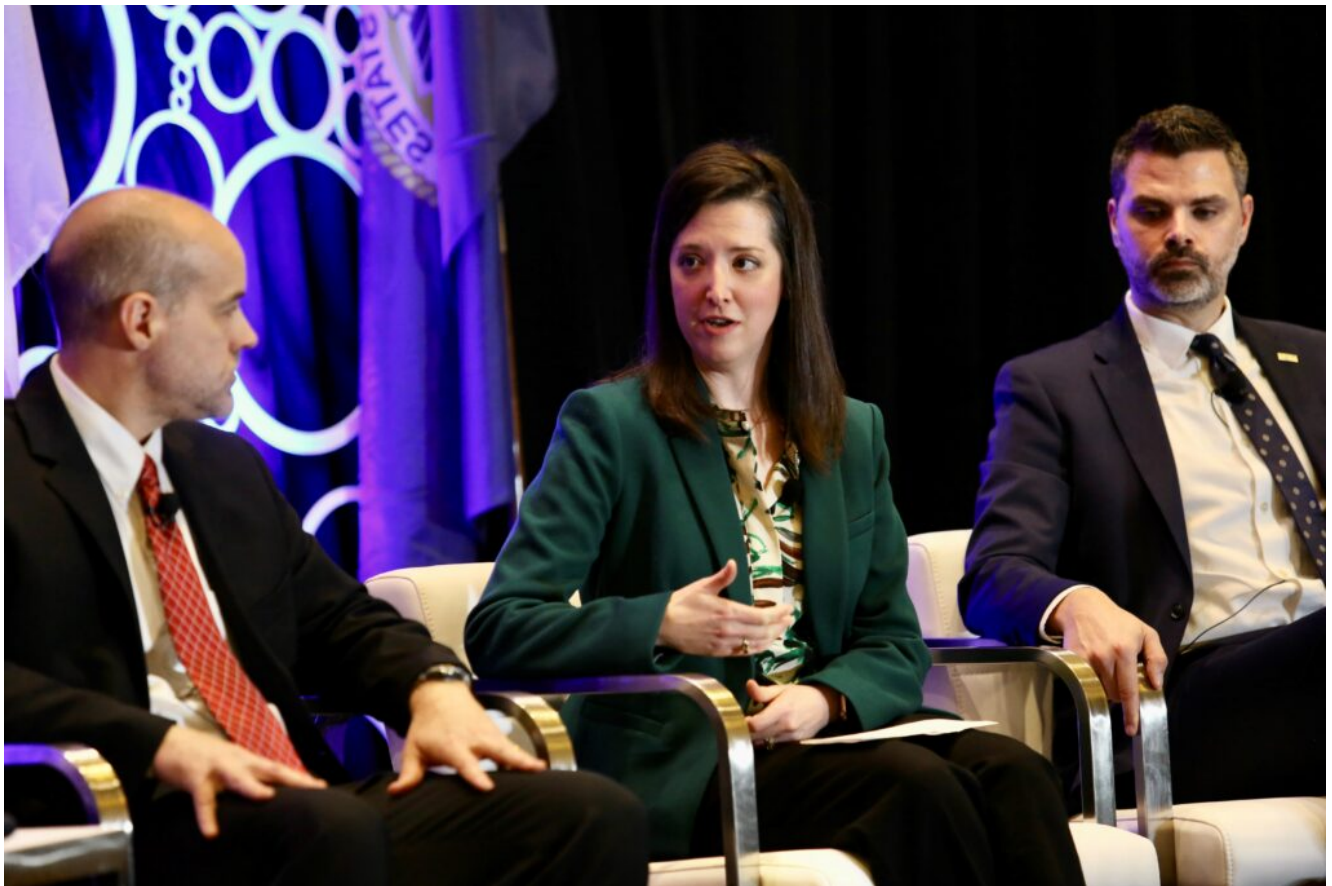
Megan Dane, director of plans and programs in the Office of Naval Intelligence, makes a point during a panel discussion on open-source data. *LISA NIPP*

NATIONAL HARBOR, Md. — Open-source data is a "fascinating," if vexing, issue that has transformed how information is disseminated and consumed, according IT professionals in an April 5 panel discussion at Sea-Air-Space 2022.

"When we say open-source intelligence and open-source information, it could be literally anything you see on the internet," said moderator Shane Harris, a senior national security writer at the Washington Post. "It could be things that are produced by the press. It is tweets, it is YouTube

videos. It is an overwhelming amount of information."

Panelist Joseph Obernberger, a software engineer in Space & Intel for Peraton, said his interest is in "big data." Peraton assists government agencies with global national security, enterprise IT and cyber solutions and supports missions that include cyber, digital, cloud, operations and engineering. Obernberger said the problem with scale and managing information is a priority for him. Furthermore, open source is a challenge because there is so much data — "a lot of stuff" — in which the intelligence community is not interested to have as open source.

"[Open source data] is huge problem," said Obernberger. "The number of Tweets per day, the number of YouTube videos per day. Seven hundred and twenty thousand hours of YouTube videos are uploaded per day. If you were to watch that, it would take 82 years. So, how can we build systems that would scale to that level? If you consider just a billion records. If it takes a computer one millisecond to process a billion records, that is 11 and a half days for one system to do that. We need to deal with trillions of records."

Panelist Megan Dane, director of plans and programs in the Office of Naval Intelligence, said, "We are really concerned with what types of information we are looking at and what we're not looking at. We try to really leverage the commercial industry and what you are able to create through big data analysis and things of that nature, and then really pinpoint through requirements what information sources and streams we need to ingest, and then really clear the way for our analysts so that they don't have to ingest or syphon through all the rest of it. That is really the most important part for us in that front-end proces."

Panelist Andy Henson, a senior vice president for artificial intelligence at SAIC, said it has "gotten harder to know what matters." He suggested a method for handling so much data

involves knowing what to look for.

"My simple filter is, what question do we want to ask with the data?" Henson said. "That gets rid of a lot of noise. What question do we want to ask of the data, and then we can get to a real subset of the data and start getting at some of those challenges."

Leidos PM: Big Vendors Must Do More to Open Electronic Warfare Interfaces to Developers

Leidos' Ran Hidalgo discusses the software challenges with

electronic warfare, stating, "A number of times, there were problems I had never seen until I'm actually in flight." *LISA NIPP*

NATIONAL HARBOR, Md. — In order to push future advancements in the area of electronic warfare, industry must find a way to open their interfaces to software developers, a Leidos program manager said during a panel discussion on electronic warfare at the Navy League's annual Sea-Air-Space symposium here on Tuesday.

One of the key challenges in the EW realm is trying to work out problems with software before sending it back to the vendor, said Ran Hidalgo, a program manager for Leidos, who said he sees this issue in his own experiences with flight.

"A number of times, there were problems I had never seen until I'm actually in flight," Hidalgo said. "I'm finding that software starts to reset for no reason. Why is that? Well, we've got to figure that out."

The next step is to take it back to the vendor, but that slows down development, he said.

"You're trying to minimize those situations where you have to kick things back to the vendor in order to actually resolve [the issue]," he said.

Hidalgo said that a lot of the future innovation with EW systems won't happen with vendors who are building those systems today, but rather with software companies down the road. He pointed to the iPhone and how it revolutionized technology, but noted that it wasn't the iPhone itself that has had the impact but the apps it hosts.

"I think about EW in this same manner when it comes to this technology," he said. "Allowing third-party developers open access to existing systems and future systems is really changing the game in terms of how EW systems can be handled."

However, bigger vendors are often resistant to this movement, and that is why industry and the government need to rethink things to an extent, Hidalgo argued.

"That is a challenge, because a lot of OEMs [original equipment manufacturers] and the big vendors that build EW systems today don't necessarily like to expose their interfaces," he said. "We get it, it's a business, but I think there needs to be some sort of concerted effort between the services, the government and industry to allow other players to play."

Coast Guard is Upping its Game on Cyber, Human Resources and Equipment, Panelists Say

Capt. Laura D. Collins, acting director of civilian human resources at the Diversity and Leadership Directorate, discusses Coast Guard advances in training while Capt. Russell E. "Rusty" Dash, the C51 Service Center commanding officer, looks on. *BRETT DAVIS*

NATIONAL HARBOR, Md. — In his last Sea-Air-Space visit in uniform, U.S. Coast Guard Commandant Karl Schultz led a panel discussion about the service, which is rapidly seeking to upgrade its equipment, software and human resources to keep up in a competitive world.

"The demand for Coast Guard services, at home and abroad, has never been higher," Schultz said.

He introduced his nominated successor, Adm. Linda Fagan, the current vice commandant, and her nominated vice commandant, Vice Adm. Steven D. Poulin.

"I will sleep well at night," Schultz said. "They are rock stars and we are in good hands."

Schultz guided the panel through a discussion of how the

service is upping its game when it comes to connectivity, human resources and equipment, including ships to replace or augment an aging fleet.

Capt. Russell E. "Rusty" Dash, the C51 Service Center commanding officer, said under Shultz's direction the Coast Guard kicked off a "tech revolution" in March 2020, to try to get away from the service's reputation of delivering "yesterday's technology tomorrow.

"The tech revolution is about empowering the people of the Coast Guard with reliable, mobile and integrated capabilities so they can better do their job," he said, noting that most Coast Guard work doesn't take place behind a desk.

It's a mobile-first approach that gives Coasties the hardware and apps they need to "do their work wherever they do their work," and includes beefing up cutter connectivity as well as on-shore networks.

The service is also getting ready to turn on a "software factory," based on the Air Force software factory model, to promote "software developed by Coasties for Coasties in a standard way," Dash said.

Capt. Laura D. Collins, acting director of civilian human resources at the Diversity and Leadership Directorate, said the service is taking a similar approach with its people.

"We want a best-in-class workforce for a best-in-class Coast Guard," she said, building on a document called Ready Workforce 2030, which calls for modernized learning and training tailored to the individual.

"In order to be the employer of choice, we've got to train to retain," she said, including on-demand e-learning not just training at dedicated centers.

Navy League CEO Mike Stevens, left, and National President David Reilly, right, present Coast Guard Commandant Adm. Karl Schultz with the Navy League Scroll of Honor. *BRETT DAVIS*

Rear Adm. Douglas Schofield, assistant commandant for acquisition and chief acquisition officer, highlighted new ships coming on line, include the offshore patrol cutter and a new icebreaker.

The offshore patrol cutter joins new national security cutters and fast response cutters, and will complement them through its presence in exclusive economic zones and beyond.

"It is critical for that multi-mission presence that you always talk about, sir," and has "outstanding human system integration," including common boat launch systems and helicopter accommodations.

Schultz noted there is significant conversations about how many ships the U.S. Navy has, but the question of how many ships the Coast Guard has tends to fall under the radar.

"We're going to have a fleet of 100 new ships here. When you

roll in these 11 national security cutters … 64, now 66, fast response cutters, 25 OPCs, that is a fleet of 100 very capable ships … I think that 100 is going to continue to up our game."

At the end of the breakfast, Schultz was presented with the Navy League Scroll of Honor by National President David Reilly and CEO Mike Stevens.