Navy Ship Construction, Repair Hampered by Lack of Suppliers, Skilled Workers

Mass Communication Specialist 3rd Class David Glotzbach grinds deck braces aboard the amphibious assault ship USS Wasp (LHD 1), July 22, 2021. Wasp was in a dry-dock selected restricted availability at BAE Shipyards as part of a planned maintenance period. *U.S. NAVY / Mass Communication Specialist 2nd Class Benjamin F. Davella III*

ARLINGTON, Va. — A senior Navy shipbuilding executive said some weaknesses in the ship construction and repair enterprise is hampered nationally by a shrinking supplier base and a lack of skilled workers.

“Material availability is a challenge,” said Matt Sermon, executive director of the Program Executive Office — Strategic Submarines, speaking Jan. 13 at the Surface Navy Association’s annual symposium in Arlington.

A former nuclear-trained surface warfare officer, Sermon said for new construction of ships, schedule and quality of material is an issue, calling material among the top issues driving schedules affecting ship repair availabilities and new construction progress.

Sermon said the end of the Cold War and the resulting so-called “peace dividend” in the early 1990s through the current era meant the number of suppliers for the submarine industrial base declined from 17,000 to 5,000, with submarine construction at a rate of less than one per year. He noted an analogous decline for surface ship construction, with the slow rate of destroyer construction and the completion of cruiser and frigate construction programs.

Globalization of industrial production also reduced the capacity of the U.S. industrial base, he said. Unlike two build-ups in response to large demand in the past, the current great power competition with the rise of China and Russia is trying to respond in the face of significant loss of commercial industrial base available to turn to defense production.

Regarding the strategic competition, Sermon said, “we weren’t on the front end of it and we’re dealing with that now.”

His list of fragile market sectors includes castings, forgings, fittings, valves, mechanical and electrical equipment.

Sermon also said, “we’re a little slow to adapt on technology when it comes to manufacturing,” including additive manufacturing, robotics and automation and non-destructive testing technology.

He also said some requirements need “some updating and some rethinking, and some innovation,” but the use of data analytics and artificial intelligence is helping address delays and shortages

Sermon stressed the United States no longer has the “high-skilled technical-trade workforce underlying foundation,” a condition he attributed to the service economy and the emphasis on a college education for young people.

Throughout the shipbuilding and repair sectors there is a pressing need for more workers with the right skills, including welders, fitters, machinists, and electricians, he said, although industry partnering with technical training schools to train new workers is helping the situation.

Caudle: Russian, Chinese Submarine Threat Taken Seriously

A P-8A Poseidon multi-mission maritime patrol and reconnaissance aircraft flies over the guided-missile destroyer USS Porter (DDG 78) during a photo exercise in 2020. *U.S. NAVY / Mass Communication Specialist 2nd Class Juan Sua*

ARLINGTON, Va. – A senior Navy admiral said the U.S. Navy takes seriously the increasingly lethal submarine forces of Russia and China but that the U.S. Navy is increasingly able to counter that threat.

“Make no mistake about it: submarines are lethal,” said Adm. Daryl Caudle, commander U.S. Fleet Forces Command, speaking Jan. 12 at the Surface Navy Association’s annual symposium in Arlington. “They are really, really good at what they do – China and Russia. They are quite motivated. … It is a major threat vector for us.”

Caudle said he is happy to report that the Russian and Chinese submarine threat is taken seriously.

“I don’t think any time in my history have I ever seen

undersea warfare taken as a team sport more so than in this current stage," he said. "It is practiced, it is command and controlled properly now, it is through a spectrum. It is not uncommon that our surface forces are holding contact on enemy submarines for a majority that we hold contact. The cueing and the ability to vector in MPRA [maritime patrol reconnaissance aircraft] to gain contact has probably never been better than it is now.

"So, this full-spectrum approach that has been going on I quite healthy," Caudle said, noting that it is easy for a ship to worry about weapon-engagement zones "and the next thing you know there's going to be two torpedoes there that you didn't predict.

"So, we need to be very wide-eyed about that threat," he said. "I think we are, and I think we're going the right way, and that's being well-practiced."

Caudle also noted the "Holy Grail" of undersea warfare since the development of nuclear-powered submarines which could stay submerged for long periods has been effective command and control of the submarines.

"We've grown over time to be very mission-command oriented," he said. "But you've still got to communicate because you've got to mass the effects at the right place and the right time."

He said communicating with submarines at depth and speed is a full-spectrum effort with systems on board surface ships, MPRA, submarines, fixed systems and with partners and allies.

"Essentially, we're getting the oceans and areas of interest wired to communicate with submarines," he said, noting the systems allow the brevity needed to assure communications security so submarines can avoid coming to periscope depth to communicate.

Rep. Gallagher: Navy Must be Ready to Counter China if Taiwan Is Attacked

U.S. Navy Boatswain's Mate 3rd Class Nicholas Rodriguez, right, and Boatswain's Mate Seaman Tony Williams move in to remove chocks and chains from an MH-60R Sea Hawk on the flight deck of the USS John Finn (DDG 113) March 10, 2021, in the Taiwan Strait. *U.S. NAVY / Mass Communication Specialist 3rd Class Jason Waite*

ARLINGTON, Va. — A member of Congress on the House Armed Services Committee said the Navy must be ready by 2025 to counter a Chinese invasion of Taiwan.

Citing the assertion of former commander of Indo-Pacific

Command, Adm. Phil Davidson, that China could move against Taiwan by 2025, Rep. Mike Gallagher (R-Wisconsin), speaking Jan 12 at the Surface Navy Association's annual symposium in Arlington, said the Unites States "must prepare for the reality that war that starts in the territorial waters around Taiwan may not stay there."

Gallagher was critical of the concept of integrated deterrence in that it fosters a false hope that soft power can deter a determined enemy.

"My concern is that integrated deterrence is the latest in a series of Pentagon buzzwords that ultimately serve as a smoke screen for dis-investing in defense and making do with a force that is too small to meet global requirements," he said. "This jargon provides pseudo-intellectual cover for political leadership that is too weak or too distracted to give the military what it needs to execute its missions and to make hard choice between military services that might actually free up resources for the main effort: deterring China from invading Taiwan."

He praised his colleague Rep. Elaine Luria (D-Virginia), also speaking at the symposium, for her "tracing the historical pattern of these calls for 'divesting to invest.'"

"What we need to integrate into deterrence is more conventional hard power: more ships, more long-range missiles, more long-range bombers in the Indo-Pacific, things that will make the PLA [People's Liberation Army] think twice," he said.

"Betting on tomorrow's transformative technology probably makes less sense than fielding reliable technologies that work today," he said.

Gallagher offered a few suggested initiatives to improve the Navy's position versus China:

- Using American territories such as Guam, Wake, and Midway to host long-range anti-air and anti-surface weapons and intelligence, surveillance and reconnaissance assets or serve as logistics nodes.
- Hardening existing defenses in the island chains.
- "Creatively use existing platforms and systems so they can better contribute to the 2025 near-term fight."
- Building a larger Navy, though he noted that ships authorized this year are not likely to be ready for combat by 2025.

He warned that the current unavailability of the Red Hill fuel farm in Hawaii was "unacceptable" and must be restored to operation. He termed it as "the beating heart of America's Pacific posture."

Gallagher – in whose district some littoral combat ships and frigates are built – listed some near-term initiatives that could improve the Navy's posture in the Pacific.

- Use littoral combat ships as stop-gap craft to enable distributed operations until the light amphibious warship comes on line.
- Put Marine anti-ship missiles on board littoral combat ships for expeditionary operations.
- Use the LCS as "mother ship for unmanned swarms" and as a command-and-control node.
- Use cruisers and early DDGs slated for retirement as missile barges and as missile-defense ships for harbors to keep valuable VLS [vertical launch system] cells "in the game" or for conventional prompt strike

Gallagher also said the Navy needs to move out on the DDG(X) next-generation destroyer and the Department of the Navy should commit to building two large surface combatants per year for 10 years.

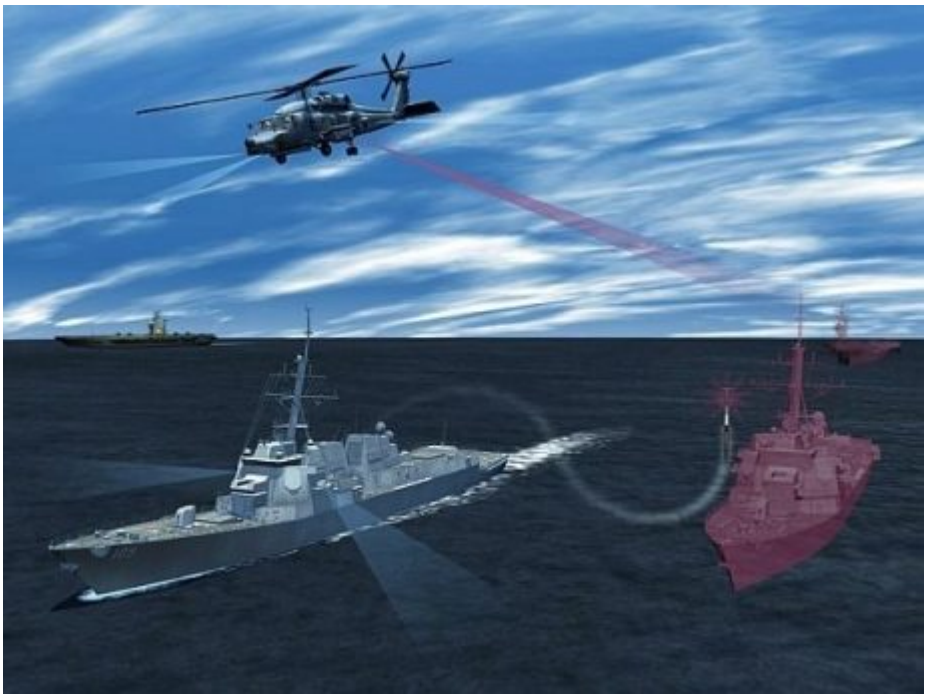
He asserted that the only short war for Taiwan would be a

Chinese victory.

“So, if we’re going to win, we have to buy time to mass assets in the region while denying a Chinese invasion,” he said. “I’m concerned that our planning has not caught up to that reality.”

He advocates the re-establishment of U.S. Taiwan Defense Command to “fully integrate wartime planning with Taiwan.”

Heliborne Electronic Warfare Pod Set for Delivery to Navy in Summer 2022



An artist’s conception of the AOEWS at work. *LOCKHEED MARTIN*
ARLINGTON, Va. — Lockheed Martin expects to deliver the first production pods of a heliborne electronic warfare system to the Navy this summer.

Joe Ottaviano, director, Maritime & Air Cyber/Electronic Warfare for Lockheed Martin, told reporters Jan. 11 at the Surface Navy Association's annual symposium in Arlington that Lockheed Martin has completed flight testing of the Advanced Off-Board Electronic Warfare (AOEW) System and expects to deliver the first low-rate initial production examples to the Navy in July or August 2022.

The ALQ-248 AOEW is a self-contained pod designed to be taken aloft by an MH-60R or MH-60S Seahawk helicopter and serve as an offboard electronic attack system to counter anti-ship cruise missiles. The AOEW will be able to detect an incoming missile, evaluate its direction and use radio frequency countermeasures to deter the missile.

The pod can be attached to either side of the helicopter, which provides power and mobility for the pod, but the pod's operation is independent of the helicopter crew and linked to the SLQ-32(V)6 shipboard electronic warfare system. The AOEW can work independently or with the ship's onboard electronic surveillance sensor, SEWIP Block 2, to detect an incoming missile and then evaluate where it is going.

The AOEW will be linked in the future to the SLQ-32(V)7 with the Block III version improvements of the Surface Electronic Warfare Improvement Program.

In September 2021, the Naval Sea Systems Command awarded to Lockheed Martin Rotary and Mission Systems, Liverpool, New York, a $17.8 million firm-fixed-price contract modifications exercise options for AOEW LRIP units.

The Navy initially ordered four engineering and manufacturing development models for evaluation that were delivered by early 2020.

CNO to Elevate Navy Safety Center to a Two-Star Command

A helicopter from Helicopter Sea Combat Squadron 3 combats a fire aboard the amphibious assault ship USS Bonhomme Richard (LHD 6). *U.S. NAVY / Mass Communication Specialist 1st Class David Mora Jr.*

ARLINGTON, Va. — The chief of naval operations is increasing the focus of the Navy on safety in its operations by elevating the Naval Safety Center to a full command.

CNO Adm. Michael Gilday, speaking Jan. 11 to an audience at the Surface Navy Association's annual symposium in Arlington, said the Naval Safety Center in Norfolk, Virginia, would be redesignated the Navy Safety Command and its commander would be a two-star admiral with experience as a carrier strike

group commander.

“That command will evaluate how the entire Navy – from the fleet commander down – manage safety and risk, and it will grade how effectively commands are self-assessing performance,” the CNO said.

The commander of the Navy Safety Command would report directly to the CNO.

Gilday said he considered the Navy’s Board of Inspection and Survey as a model for the Naval Safety Command and how it will perform.

The Navy has suffered a number of high-profile collisions at sea in recent years, most notably the 2017 collisions of the Arleigh Burke-class guided-missile destroyers USS Fitzgerald and USS John McCain with merchant ships, resulting in the deaths of 17 Sailors. The amphibious assault ship US Bonhomme Richard was damaged beyond economical repair in 2020 by a fire while pierside.

Gilday noted in his speech that the fleet had suffered “14 other major fire events in the past 12 years.”

Kitchener: SWO Retention on An Upward Trend

Vice Adm. Roy Kitchener, speaking at the Surface Navy Association's annual symposium. *U.S. NAVY*

ARLINGTON, Va. – The retention of surface warfare officers is improving, the U.S. Navy's "surface boss" said, one metric that affirms the Navy's efforts to assess its readiness and to take action to address the challenges.

"Within the wardroom, SWO retention continues on an upward trend, a 5% increase over the past five years, exceeding or remaining on par with the aviation and submarine communities," said Vice Adm. Roy Kitchener, speaking Jan. 11 to an audience at the Surface Navy Association's annual symposium in Arlington, Virginia.

"While a positive indication, there's still a lot of work to do, and we're really not satisfied where we are," Kitchener said.

"We'll be looking at the entire career spectrum through an analytical lens to determine what our officer retention goal

should be," he said. "We need to think differently about how we manage retention. I would submit that past retention policies may not help us retain the best talent as we move into the future."

Kitchener said the Navy is looking at how other services and other high-performing organizations "manage their talent pool."

He also said the Navy will look at important factors such as childcare and family planning.

"We're also devoting resources to retention in a number of ways throughout the SWO career path with increased compensation, diverse education opportunities, tours within industry, and additional flexibility in their career path," he said. "We have a lot of work to do in this area, but we are committed to the task."

Lockheed Martin Upgrading SPY-1 Radars on 21 DDGs to Counter Evolving Threats

Arleigh Burke-class guided-missile destroyer USS Barry (DDG 52) pulls into Commander, U.S. Fleet Activities Sasebo, Japan, in 2016. *U.S. NAVY / Mass Communication Specialist 3rd Class Kristopher S. Haley*

ARLINGTON, Va. — Lockheed Martin is continuing to upgrade primary radars on a number of the U.S. Navy's guided-missile destroyers (DDGs), a company official said. Older SPY-1 versions are being modified with digital Low Noise Amplifiers, or LNAs, which can improve their sensitivity and thereby improve the accuracy, range and discrimination of the radar.

"How do you develop a low-cost, high-payoff solution to keep SPY-1 relevant as the threat evolves?" Jon Rambeau, Lockheed Martin's vice president and general manager for Integrated Warfare Systems and Sensors, asked rhetorically in an interview with *Seapower*, pointing to the LNA as a step in that direction.

The SPY-1 radar is the primary sensor of the Aegis Combat System on the U.S. Navy's Ticonderoga-class cruisers and

Flight I, II and IIA Arleigh Burke DDGs and is used to detect and track aircraft, cruise missiles and ballistic missiles.

The LNA is part of the upgrade of the 21 Flight I and II DDGs to enable a “full BMD [ballistic missile-defense] capability in accordance with the 2030 Missile Defense Review,” Rambeau said.

He said Lockheed Martin is under contract for upgrading nine SPY-1 arrays under funding provided by the Navy and the Missile Defense Agency. The arrays are being tested and made ready for installation of the DDGs.

Rambeau there was “some discussion around the Navy’s future plans for those 21 ships and that’s something we’re watching very carefully.”

He said the LNA upgrade may be something the company thinks can be relevant for international customers as well.

Q&A: Mark Vandroff, CEO, Fincantieri Marinette Marine

The 21st Littoral Combat Ship, the future USS Minneapolis-Saint Paul, launches sideways into the Menominee River in Marinette, Wisconsin, on June 15, 2018. *LOCKHEED MARTIN*

Mark Vandroff, a retired Navy captain and engineering duty officer, was installed last summer as CEO of Fincantieri Marinette Marine, shipbuilder of the U.S. Navy's Freedom-class littoral combat ship and now the Constellation-class frigate. A former ship program manager, he brings extensive customer experience to his company.

Vandroff was interviewed by Senior Editor Richard R. Burgess. Excerpts follow.

With some experience now as a shipyard official, what has surprised or impressed you about being on this side of the shipbuilding equation?

VANDROFF: Surprised would be a strong word, but I'm impressed by the dedication and hard work of the men and women who build ships. And by "building ships" I mean a very wide range of activity.

One of my mentors, teachers and former bosses, Sean Stackley – the former LPD 17 program manager, former ASN RDA [assistant secretary of the Navy for research, development and acquisition] and now senior executive with L3Harris – used to tell us when he was coaching shipbuilding program managers that if you can build a ship, you can do anything because nothing is harder or more complicated than building a ship, the most complex of all human undertakings. What the government program managers deal with is certainly a complicated process on the government side, but now, with a few months as the head of the yard here in Marinette, it's an even renewed appreciation for just how complicated and just how many things have to go right to get a ship built, everything from the industrial trades, welding, cable pulling, painting to all of the planning and industrial methods, to the engineering design to the purchasing to the contracting, a myriad of legal compliance for us, and all the finance and economics of a business of that size.

It's not just running a complicated business, but it's running a complicated business with a very complicated product and a series of complicated relations both with customers and with sub-suppliers.

What insight has your experience as a Navy ship procurement official given you that can help improve the shipbuilding industrial base?

VANDROFF: When you take someone with program management leadership on the government side and put them into industry you certainly bring an intimate knowledge and understanding of what the customer wants.

Early on in my tenure, some of the folks on my leadership team seemed puzzled during a meeting by something that our primary government partner on the frigate program had asked us to do. Everyone was scratching their heads and were like 'Why would they want us to do that?' I said, back in my days in the DDG

51 program, if I were the government PM, I would want us to do exactly what Capt. Smith had just said even though it didn't necessarily make sense to someone who didn't have the background of the kind of dynamics that play in at NAVSEA [Naval Sea Systems Command] and within the OPNAV [Office of the Chief of Naval Operations] and Pentagon staff. I immediately understood what the government customer was looking for and I could translate that to my industry colleagues.

This will sound odd as the head of the Mariette Marine shipyard: One of the things about our current shipbuilding industrial base is that it's very highly specialized. My yard is highly specialized, given the fact that I'm constrained by the St. Lawrence seaway into the size of ships that I can build. Huntington Ingalls Newport News Shipyard really wouldn't ever build something small because given the overhead of maintaining facilities to build aircraft carriers. The economics constrain them to build big and for other yards each have their niche. While niches are very efficient and people can get very good at doing their special thing, I worry that the future will require a great deal more flexibility of yards that can do lots of things because the future is always uncertain. This is one of the reasons Fincantieri Marine Group is creating a system of yards across our Wisconsin sites, to continue supporting our customers' future requirements and missions.

Mark Vandroff, CEO of Fincantieri Marinette Marine.

What kind of supply-chain issues currently are of concern to Marinette Marine?

VANDROFF: Supply chain is a hot topic across the shipbuilding industry. Certainly, COVID had a major impact on a lot of our sub-suppliers, mostly in their ability to hold schedule. We've seen that across both commodities and finished products especially electronics and anything that has a microchip as a component, but we've also seen it in things like switch gear and transformers. Most shipbuilders today rely on a just-in-time delivery system because you want to avoid the warehousing costs of keeping large amounts of material warehoused. One of my top concerns right now is the supply chain impacts we're seeing.

What capital improvements are in work to get ready for the frigate program?

VANDROFF: We're making four extensive capital improvement investments in Marinette Marine in order to be able to build the frigate.

Investment No. 1 is in a shiplift. Currently, we build the LCS on land and then introduce it to the water via the time-honored system of a side-launch. We're not going to be able to stern-launch or side-launch a frigate. It's too big and we would have to install certain equipment – vertical launch systems, for example – after we side-launched it because of alignment issues. That's not a very economically efficient way to build a ship.

I would urge you and your readers to Google 'shiplift' and look at YouTube, there's some great videos from around the world. It's really cutting-edge shipbuilding technology. There's a transfer platform held in place by, in our case, a set of 58 winches that run attached, 29 on each side, to the platform. You can translate the ship from the land onto the platform, and the winches take tension as the ship rolls onto the platform in order to keep the platform level. And then when you're ready to put the ship into the water, the winches lower the platform until you get to the point where the ship is then floating from its own buoyancy.

For someone who's building a ship on the Great Lakes here in the Menominee River floating out into Lake Michigan, the ability to do that with a shiplift is very attractive. The shiplift construction is ongoing and we expect it to complete by the end of 2022.

Right now, we build the littoral combat ships and multi-mission surface combatants in a two-bay erection facility. We can assemble an entire LCS indoors. Building indoors is very important in the Wisconsin winters. That erection bay is not big enough for a frigate. The frigate-size erection bay, Building 34, is nearing completion for May. It will have two bays, each big enough to hold an entire erected Constellation-

class frigate.

A new state-of-the-art panel line will be done in a few weeks. This will take steel, cut it into panels, stiffen it up, and then weld it together into modules and sub-assemblies all in one covered area.

We do also have plans sometime early in the frigate process to add to our blast-and-paint capability. When we go to two frigates a year, we will need more blast-and-paint capability and we have a plan to repurpose an old building.

Do you have any plans to increase the size of your force?

VANDROFF: My No. 1 area of effort is the workforce. I will need to increase the workforce in order to fully man the Navy's plan for the frigate program. Between now and the end of 2023, we'll need another 400 workers: about 300 in the trades — welders, painters, shipfitters, electricians — and another 100 engineers and other white-collar workers.

We have a unique concern in the Marinette Menominee area: a missing middle in housing. We pay a nice living wage to our workforce such that they're thankfully making too much to qualify for low-cost government-subsidized housing and yet there's high-end housing, especially along the lake and the river and other places where you would see nice homes. What we really could use is more middle-class apartments in the area of Menominee and Marinette. We've talked to both states about that and they're thinking of creative ways of helping the natural market forces respond to that. Right now, we've got a lot of folks who commute a fairly long way to get to the yard. What I would really like is the available housing to keep the workforce close to the shipyard so that it's convenient for the workers to get to the yard. If we provide a convenient place to work, we will be able to attract the workforce we need.

We still have not received formal requirements from the

federal government that would cause us to have to mandate that our workforce be vaccinated against COVID-19. We've taken steps to provide vaccinations very conveniently and at no expense or time to the employee. We've had a reasonably good turnout, but I fear that there is some percentage as yet unknown of my workforce that would just not feel comfortable being told to take a COVID vaccine. We'll do everything we can to continue to make it convenient for employees to get vaccinated. But if the government lays that mandate upon me, I am very concerned that would have a negative impact on my ability to maintain a sufficiently sized workforce to execute all the work that the yard currently has under contract.

Some shipyards – like Huntington Ingalls for example – have an apprentice training program. Do you have anything similar?

VANDROFF: We do have an equivalent that I'm very excited about that will serve us well in the future and can easily be expanded via the Northeast Wisconsin Technical College [NWTC], a system of technical community colleges in northeast Wisconsin. We have a fabulous relationship with them, and they have gone so far as to hire retired Marinette employees to their faculty. The provide technical training in a variety of shipyard-related skills at their campus, which is within walking distance of the shipyard. They're teaching welding with our welding procedures, using our welding equipment, so a graduate of NWTC, whether it's in welding or ship-fitting or electrical work, cable-pulling or journeyman electrician or entry-level electrician, comes out of NWTC work-ready and we can hire them. As we recruit, those students know that they've got a guaranteed path to a job with us and a career in shipbuilding. We've also reached out to local high schools and their shop programs to encourage the kind of skills set that is useful to us in the shipbuilding industry.

At the white-collar level, the University of Wisconsin Green Bay has reached out to my head of engineering for discussions. They've allowed us to shape their engineering curriculum.

Someone coming out with a mechanical engineering degree has got an academic background and a skillset that is well-matched to our needs for entry-level engineers.

What is the status of the Constellation-class frigate?

VANDROFF: We're in the detail design phase. The next big milestone of that phase is the critical design review scheduled for February 2022. I have great teammates on the Constellation team: L3Harris, Gibbs & Cox and Trident Maritime Systems. The Navy has been great. I could not ask for a better partner than the current leadership in PMS-515, and so, that's a big milestone for us. It's not the end of detail design but it basically marks the completion of the functional design and shows that we have established the right technical baseline to move forward.

After that, we'll have a production readiness review in March as we continue to achieve a level of production maturity so that we can confidently start building the ship in April of 2022. That review will show that we have the level of design maturity such that we can start building the ship with the right expectation of 'measure twice, cut once.' We don't want to build a ship to an immature state and then have a significant level of rework because it's not good enough for either us or the Navy. We're driving for a very high level of maturity so that we have an efficient start of production in April.

From that point on, we'll go through all the normal milestones that a ship would have after it starts production – the laid keel, eventual float off, trials – and we're looking forward to a delivery to the Navy of the first ship in 2026.

Are there challenges to using a foreign-designed hull?

VANDROFF: When you take a design that is not U.S. and translate it to the United States to build, you do run into the U.S. Navy technical standards of performance, which are

different than a lot of our partner navies, especially in the area of damage control. That induces modifications to the design. The U.S. Navy's philosophy and standards are more steel and more frequent water-tight bulkheads for different compartmentation.

We now have the Buy American Act and whenever you take perhaps a piece of equipment that would be sourced from a European supplier and sourced out to a U.S. supplier, there will be design changes with that and that's, again, something that we've accounted for and are executing.

What can the Navy and Congress do to make it easier for you to deliver ships on time and on cost?

VANDROFF: Shipbuilding is really hard. There's nothing that the Navy or Congress can do to make it less hard. I will say the Navy always helps when they really understand their requirements and that they have stability in those requirements.

I am fortunate in Marinette in my relationship with my Navy supervisor of shipbuilding partner – the organization that does oversight – has been entirely reasonable. They have been very responsible partners. They're clearly representing the Navy's interest, but they're not doing it in a way that is at all punitive or looking to impact my progress. They're just looking to make sure that the Navy is getting the quality product that they want. For that, I'm very grateful.

If you look at big trends broadly – cost and schedule, but especially cost – a good chunk of our overhead goes to paying the employee healthcare costs. That is getting worse, not better. And that overhead cost gets passed right on to the customer in terms of cost on a contract.

The government has shown some flexibility in the ability for us to have a favorable cash flow. Certainly, COVID helped that, but it helps our financing costs from a business

standpoint to have a quicker flow of cash to have a higher percentage of the ultimate cost of a vessel in available progress payments which were done in order to keep the defense industrial base healthy during COVID. Some of those should probably be made permanent, and for a company like mine you would see lower financing costs. Because financing costs make their way into overhead rates, that would then allow us to deliver product more effectively and more cost-effectively to the ultimate customer.

Aegis Going Through Substantial Digital Transformation, Lockheed Martin Says

USS Wayne E. Meyer (DDG 108) arrives recently at Naval Surface Warfare Center, Port Hueneme Division with the help of a tug boat. The ship's namesake is the late Rear Adm. Wayne Meyer, widely recognized as the Father of the Aegis Weapon System, considered a cornerstone of the military service. *U.S. NAVY / Photo by Eric Parsons*

ARLINGTON, Va. — The Aegis Combat System is going through substantial digital transformation as its processing speed is increased and more sensors and weapons are integrated with it, a Lockheed Martin official said.

The Aegis Combat System's "relevance to the fleet has never been greater," said Jon Rambeau, Lockheed Martin's vice president and general manager for Integrated Warfare Systems and Sensors, in an interview with *Seapower*.

Rambeau, who formerly worked with the company's Acoustic Rapid Capability Insertion programs to periodically and rapidly upgrade U.S. Navy submarine sensor capabilities through software refreshes, is now continuing the same concept with Aegis.

The company is implementing automated test capabilities for Aegis. Rambeau cited the implementation of those on Baseline 10 version as “the most comprehensive evolution of Aegis we’ve ever undertaken. … So, we we’ve automated about 20,000 of our software test procedures as part of our Baseline 10 efforts to try to improve our efficiency and speed of capability to the fleet.”

He said the company is “working to implement model-based engineering processes across the board with the goal of getting the same quality product we’ve always delivered but getting that to the fleet much more rapidly. So, we’re focused on speed of capability to make sure we’re keeping the fleet relevant.”

In a broader perspective, Rambeau said the company is working to focus its culture on creating an environment where government, small business and academia can integrate efforts with the company to work seamlessly across the Aegis enterprise. He credited the work of the Forge, a Navy software development “ecosystem” activity designed to field advanced capability more rapidly, and said the company is working to be positioned to receive the capabilities developed by the Forge “and make sure we’re bring the systems engineering rigor and the collaboration to support the responsible integration of those capabilities into the Aegis baseline.”

Rambeau also said the company is working to keep Aegis relevant by integrating future hard-kill and soft-kill capabilities, including that of reducing the cost per kill of systems to defeat ballistic and hypersonic missiles. He cited the company’s HELIOS laser weapon system, which is the first laser weapon system integrated with Aegis and is going through its first installation on the Arleigh Burke-class guided missile destroyer USS Preble.

Navy’s Newest Fire Scout UAV Version Prepares for Westpac Deployment

Sailors attached to Helicopter Sea Combat Squadron (HSC) 23, assigned to the Independence-variant littoral combat ship USS Jackson (LCS 6) and Naval Engineering Technology (NET) technicians perform ground turns on an MQ-8C Fire Scout on the flight deck of Jackson. *U.S. NAVY / Mass Communication Specialist 3rd Class Andrew Langholf*

ARLINGTON, Va. – The newest version of the Navy’s Fire Scout UAV is being prepared for deployment to the Western Pacific, according to an official photograph.

An MQ-8C Fire Scout was depicted in a Dec. 22 official Navy photograph taken on the deck of Independence-class littoral combat ship USS Jackson (LCS 6) while in port in Apra Harbor, Guam. The caption stated the Jackson was part of Destroyer

Squadron Seven “on a rotational deployment in the U.S. 7th Fleet area of operation to enhance interoperability with partners and serve as a ready-response force in support of a free and open Indo-Pacific region.”

The MQ-8C in the photograph was going through predeployment functional ground checks for a detachment of Helicopter Sea Combat Squadron 23 – based at Naval Air Station North Island, California – that will operate the MQ-8C from the USS Jackson.

The MQ-8C, which achieved initial operational capability in June 2019, is an upgrade to the Fire Scout System mainly in that it uses a Bell 407 airframe, which is larger than the earlier-design MQ-8B’s airframe and equipped with more powerful engines, thus having a greater payload and endurance, up to 12 hours on station.

The MQ-8C can carry the ZPY-8 search radar or an electro-optical/infrared sensor and uses the same ground control station and the MQ-8B. The Navy plans to add more capability in the form of Link 16 data link, passive targeting, and a mine-countermeasures payload.

Northrop Grumman was under contract to deliver 38 MQ-8Cs, all of which have been delivered. The company has delivered 30 of the earlier MQ-8B version.

Editor’s note: This article has been updated and corrected from a previous version.