Naval Postgraduate School Examines Hybrid Force 2045

This week, the Naval Postgraduate School is hosting a hybrid version of its annual Warfare Innovation Continuum, focused on the future hybrid force. *Naval Postgraduate School*

The U.S. Naval Postgraduate School (NPS) is conducting its annual Warfare Innovation Continuum (WIC) scenario this week on a critical naval priority: the future hybrid force.

Led by the NPS Naval Warfare Studies Institute (NWSI), WIC 2021 is addressing a "design challenge" of "How might emerging technologies, new operational concepts and alternative fleet designs contribute to a more effective naval force across the spectrum from competition to conflict, and how do the alternative fleet designs enhance the effectiveness and resilience of joint, combined and coalition forces across all domains?"

NWSI serves as a hub to facilitate teamwork and collaboration with the NPS innovation ecosystem to optimize NPS' interdisciplinary educational and research response to naval warfighting needs.

The hybrid event is led by retired Capt. Jeff Kline, the NWSI WIC director, and research associate Lyla Englehorn, the NWSI concepts branch lead, and is taking place both in person on the NPS campus in Monterey and on the "Virtual Campus" via Microsoft Teams this week.

According to NPS spokesman Dave Nystrom, the organizers expect more than 140 participants, including facilitators, panelists, moderators, observers and students, with international participation from Australia, Indonesia, Ecuador, Greece, Romania and the United Kingdom. "Participation teams" will look at the design challenge from different perspectives, with

two working at the classified level.

“WIC leverages classroom projects, theses and research in advancing naval concepts, assessing new technologies and developing tactics while enhancing our students’ educational experience and sharpening their combat skills,” Nystrom said. “It’s a perfect example of how NPS combines student operational experience, defense-focused education and applied research to deliver real solutions and leaders educated to employ them.”

Retired Vice Adm. Ann Rondeau, president of NPS, told the participants that Hybrid Force 2045 theme will examine “how the naval services will operate in an era of robots, drones, crewed and un-crewed systems as part of the CNO’s vision outlined in the NAVPLAN and [Marine Corps] commandant’s vision outlined in Force Design 2030. As you consider this challenge, joint concepts and capabilities must also be accounted for as it is the Joint Force that will allow us to fight and win but will also give our nation’s leaders options in the competition phase or in preparation to employ our kinetic capabilities in conflict.

“This is the tenth year NPS has hosted the warfare innovation workshop, which is fully integrated into our year-long Warfare Innovation Continuum,” said Rondeau. “Following the workshop, the Continuum will carry on your ideas, proposed concepts and assessments of emerging technologies as capstone projects, theses work, prototyping, experimentation, modeling and simulation, and other research threads. You are the first step in, and now completely part of, that Continuum.”

NWSI Director, retired Vice Adm. Dave Lewis added, “Using participant insights, NWSI will begin to inspire formation of various interdisciplinary research groups to address major topics of concern for our naval service. We anticipate the Hybrid Force 2045 Warfare Innovation Continuum to morph into a NWSI Research Task Force named “Hybrid Force 2045” in early

fiscal year ’22. Other NPS Research Task Forces, which the WIC will inform, are the already established Task Force Overmatch and another Task Force planned for FY22 “Maritime Gray Zone.” Research groups will leverage the WIC and follow-on workshops as initiating events and as a construct to begin their own work,” Lewis said. “As some of the very best and brightest from industry, academia, system commands and defense labs, our WIC participants are invited to participate in these efforts.”

In its 70th year, NPS provides defense-focused graduate education, including classified studies and interdisciplinary research, to advance the operational effectiveness, technological leadership and warfighting advantage of the naval service.

Kaman Proposes KARGO UAV to Marine Corps for Autonomous Re-Supply

The Kaman KARGO UAV is designed to carry cargo in a conformal pod (right) or sling-loaded (left). *KAMAN CORP.*

ARLINGTON, Va. — Kaman Corp., builder of the K-MAX unmanned helicopter for the Marine Corps, is proposing an autonomous quadrotor unmanned helicopter for the Marine Corps to enhance its re-supply capabilities in expeditionary advanced based operations, the company said in a Sept. 21 press conference and news release.

The KARGO UAV is designed to be a robust, reliable, easy-to-operate UAV that can be shipped in a standard ISO container,

quickly assembled by two personnel, and flown with internal pod-contained cargo or external sling-loaded cargo.

The KARGO UAV will be a quadrotor with a length and width of 24.4 feet, a height of 7.5 feet and a weight of 1,340 pounds. It will be powered up to a speed of 121 knots by a 300-shaft horsepower gas turbine engine to carry payload up to 800 pounds. Range will vary according to payload. For example, a 600-pound payload could be carried 143 nautical miles one way. The range with no payload is planned for 523 nautical miles.

“The Kaman KARGO UAV is the only system of its class that is purpose-built to provide deployed Marines, Sailors, Airmen, Soldiers and Coast Guard autonomous resupply in the lethal, fluid combat environment that future military operations will entail or for regular logistics missions. Our deployed service men and woman have persistent logistics challenges that we are answering with this reliable, maintainable and affordable solution,” said Ian Walsh, CEO of Kaman Corp., in the release.

Kaman has been flight-testing a 50%-scaled demonstrator UAV of the KARGO UAV to refine the design. The demonstrator was developed using Kaman’s internal research and development funds. The company plans to build a full-scale KARGO UAV and flight-test it in 2022.

Kaman has extensive experience in fielding autonomous cargo UAVs. Two of the company’s K-MAX UAVs were operated by the Marine Corps a decade ago in the mountains of Afghanistan. Romin Dasmalchi, senior director of business development, government, at Kaman, said in the press conference, said that the two K-MAX UAVs delivered accrued 4.5 million pounds of cargo and saved numerous lives by reducing the needs for vulnerable truck convoys. The two UAVs, designated CQ-24A by the Marine Corps, were stored for several years, but Kaman was contracted by the Corps to restore them to flight and upgrade them for more demonstrations of an autonomous cargo delivery

capability.

Dasmalchi said that the KARGO UAV would reduce manpower and training requirements for the Corps and provide a self-deploying capability. He said the Marine Corps has not published requirements for a cargo UAV but are in the process of developing its requirements.

Walsh said the KARGO UAV has potential to serve as a vertical replenishment aircraft got the Navy's at-sea logistics force.

He said the KARGO UAV is being designed with a gas turbine engine to meet a high technology readiness level to reduce cost and risk.

"The KARGO UAV leverages commercial off-the-shelf components as well as thousands of hours of automated and autonomous flight data from Kaman's K-MAX TITAN program, to reduce schedule and technical risk," Kaman said. "Kaman selected Near Earth Autonomy as a partner on the pilot KARGO UAV program. Leveraging ongoing and concurrent collaboration between the two companies on the U.S. Marines Corps K-MAX TITAN UAS, Near Earth will provide obstacle avoidance and other technologies such as precision landing, sense and avoid, and navigation in a GPS-denied environment."

Navy Upgrades F-5 Adversary Fighter, Improving Safety, Readiness

The Navy delivered the first F-5N aircraft to Naval Air

Station Patuxent River, Maryland, to begin ground and flight test of the F-5 block upgrade prototype project. The results of these tests will provide data to be used as a major element in the conversion of the 16 F-5E and six F-5F aircraft the Navy recently acquired from the Swiss air force. *U.S. Navy Photo*

PATUXENT RIVER, Md. – The Navy's Specialized and Proven Aircraft program office (PMA-226) recently delivered the first F-5N aircraft to Naval Air Station Patuxent River, Maryland, to begin ground and flight test of the F-5 block upgrade prototype project, the Naval Air Systems Command said in a Sept. 20 release.

Aligned with the Navy's strategic imperative of increasing capability and enhancing lethality, the newly redesigned tactical fighters will include features found on modern aircraft that improve both safety and readiness.

The F-5 aircraft, performing for many years as a high-altitude, high-speed tactical fighter used by the Navy and Marine Corps as an adversary aggressor, lacks modern safety systems, avionics and common tactical capabilities found in modern aircraft. This F-5N aircraft is one of three F-5Ns that will be used as prototypes of the modernized cockpit, avionics and supporting aircraft architecture. These upgrades improve safety, capability and reliability, while resolving increasing obsolescence issues.

Upon successful completion of test, the program office will use these upgrades as a major element in the conversion of the 16 F-5E and six F-5F aircraft the Navy recently acquired from the Swiss air force. The program office will convert these 22 aircraft under the Avionics Reconfiguration and Tactical Enhancement/Modernization for Inventory Standardization (ARTEMIS) program. PMA-226 successfully completed the independent logistics assessment for the ARTEMIS Program in June and anticipates reaching a Milestone C decision in early fiscal 2022.

“Constructive collaboration with our partners, the fleet and the PMA-226 team drove mission success despite the technical, schedule and management challenges of integrating 21st-century technology into a 1970s airframe during the pandemic,” said Boyd Forsythe, PMA-226 adversary team lead.

The F-5 aircraft receiving the block upgrade prototype modifications will be designated F-5N+/F+. The potential risk of loss of a pilot and/or aircraft will be reduced by adding necessary instrumentation that provides air-to-ground warning, severe weather protection and fuel level warnings. This upgrade will also add tactical capabilities designed to improve “friendly” force air-to-air training.

Given the significant use of commercial-off-the-shelf components with well-defined maintenance and support equipment requirements for the block upgrade prototype configured aircraft, the product support strategy will be organizational level (O-level) to original equipment manufacturer. The block upgrade O-level preventive maintenance will consist of inspections, cleaning and scheduled maintenance tasks. Additionally, the O-level maintainers will load system software using currently fielded commercial off-the-shelf portable electronic maintenance aids.

“This program will provide modernized aircraft with exceptional avionics and tactical capabilities which are needed to allow pilots to practice the tactics and techniques employed against a near-peer threat. Delivery of these improvements will ensure realistic and relevant tactical training the pilots need to win in combat,” said Capt. Ramiro Flores, PMA-226 program manager.

PMA-226 is responsible for life cycle cradle-to-grave management of several legacy and out-of-inventory aircraft and engines, assigned by Naval Air Systems Command and contracted air services. Assigned platforms and services include: Adversary Aircraft (F-5, F-16); Contracted Aircraft Services;

U.S. Naval Test Pilot School/Naval Postgraduate School T-38, H-72, X-26, U-6, NU-1B, O-2 and OH-58C; and Out of Active Navy Inventory aircraft T-2, H-2, H-3 and A-4, in support of the Naval Aviation Enterprise and international partners.

Marine Corps Harvest HAWK+ Reaches Full Operational Capability

A KC-130J Super Hercules with the Harvest Hawk+ sits staged on the flight line at Marine Corps Air Station Miramar, California. *U.S. MARINE CORPS*

PATUXENT RIVER, Md. – The Tactical Airlift Program Office (PMA-207) KC-130J integrated product team successfully completed full operational capability of the Harvest Hercules Airborne Weapons Kit (HAWK) Plus (HH+), Naval Air Systems Command said in a Sep. 20 release. The 10th and final aircraft modified to the HH+ configuration was delivered to the Fleet Marine Forces Aug. 26.

The aircraft modifications were part of the Marine Corps KC-130J Intelligence Surveillance and Reconnaissance (ISR) / Weapons Mission Kit program that began in 2015. The program improved the existing Marine Corp KC-130J Harvest HAWK system by integrating the MX-20 electro-optical/infrared multi-sensor imaging system and adding door-mounted missile employment capability.

Harvest HAWK+ aircraft modifications began in 2015 with the first aircraft delivering in October 2015. NAVAIR's aircraft

prototype systems division at Naval Air Station Patuxent River, Maryland, modified the first six aircraft while Sierra Nevada Corp. in Colorado Springs, Colorado, modified the last four aircraft.

Five HH+ aircraft were delivered to Marine Aerial Refueler Transport (VMGR) 352 in Miramar, California, and four aircraft were sent to VMGR-252 in Cherry Point, North Carolina. One HH+ aircraft will remain at VX-20 in Patuxent River for Block 8.1 and future HH+ testing.

“We are proud to provide the Marine Air-Ground Task Force with an updated intra-theater Close Air Support and Multi-Sensor Imagery Reconnaissance capability,” said Capt. Steve Nassau, PMA-207 program manager. “I couldn’t be prouder of my government and contractor team for delivering this critical weapon system to our warfighters.”

USNS Choctaw County Arrives in Lebanon for First-Ever Central Partnership Station

Sailors assigned to Coastal Riverine Squadron 10 enforce a security zone around the Military Sealift Command expeditionary fast transport vessel USNS Choctaw County (T-EPF-2) in the Gulf of Tadjoura, Djibouti Feb. 10, 2016. *U.S. NAVY / Master-at-Arms 2nd Class Perry Lafoe*

BEIRUT – Expeditionary fast transport ship USNS Choctaw County (T-EPF 2) arrived in Beirut, Lebanon, Sept. 20, to participate in U.S. Naval Forces Central Command’s (NAVCENT) first-ever Central Partnership Station (CPS) mission, the command said in

a Sept. 21 release.

The CPS mission in Lebanon is designed to build partner capacity through subject-matter-expert exchanges, enhancing interoperability and the military-to-military relationship between the U.S. Navy and Lebanese Armed Forces (LAF).

“This is a new opportunity for the U.S. Navy to work with our Lebanese counterparts,” said Vice Adm. Brad Cooper, commander of NAVCENT, U.S. 5th Fleet and Combined Maritime Forces. “We are ushering in a new era of strengthening and expanding capacity building across the region.”

The mission includes a series of subject matter expert exchanges between LAF and NAVCENT personnel on mine countermeasures, disaster response, public health and construction capabilities.

U.S. forces working alongside their LAF counterparts include the Choctaw County, explosive ordnance disposal technicians and Navy divers, a medical and health engagement team, and a Seabee construction battalion. Seabees are constructing a maritime security support facility with LAF engineers.

The U.S. 5th Fleet area of operations encompasses nearly 2.5 million square miles of water area and includes the Persian Gulf, Gulf of Oman, Red Sea and parts of the Indian Ocean. The region is comprised of 21 countries and includes three critical choke points at the Strait of Hormuz, the Suez Canal and the Strait of Bab-al-Mandeb at the southern tip of Yemen.

Navy T-45C Goshawk Crashes in Texas

A T-45C Goshawk attached to Training Air Wing 2 lands aboard the aircraft carrier USS Gerald R. Ford (CVN 78), Dec. 10, 2020. *U.S. NAVY / Mass Communication Specialist 3rd Class Zack Guth*

ARLINGTON, Va. — A U.S. Navy T-45C Goshawk jet trainer aircraft crashed Sept. 19 in Lake Worth, Texas, approximately two miles northeast of Joint Reserve Base Fort Worth, the service said in a release.

The two pilots ejected from the aircraft. The instructor pilot was reported in stable condition; the student naval aviator was reported in serious condition — his injuries were not life threatening. Both were transported to local medical facilities for treatment.

The aircraft impacted the ground in a civilian neighborhood causing damage to at least three homes. Emergency services responded to the scene. The Navy is cooperating fully with local authorities.

The T-45C was assigned to Training Air Wing Two based at Naval Air Station Kingsville, Texas. The pilots were conducting a routine training flight that originated at from Corpus Christi International Airport.

Safety and environmental teams have been sent to the crash site for scene assessment. The incident is under investigation.

USS Wyoming Successfully Tests Trident II D5LE Missiles

The U.S. Navy conducted a scheduled, two-missile test flight of unarmed life-extended Trident II (D5LE) missiles from USS Wyoming (SSBN-742), an Ohio-class ballistic missile submarine, on the Eastern Test Range off the coast of Cape Canaveral, Florida, Sept. 17. *U.S. NAVY*

WASHINGTON – The U.S. Navy conducted a scheduled, two-missile test flight of unarmed life-extended Trident II (D5LE) missiles from USS Wyoming (SSBN 742), an Ohio-class ballistic-missile submarine, on the Eastern Test Range off the coast of Cape Canaveral, Florida, Sept. 17, the From U.S. Navy Strategic Systems Programs office said in a Sept. 18 release.

This successful test was part of a Demonstration and Shakedown Operation, designated DASO-31. The primary objective of a DASO is to evaluate and demonstrate the readiness of the SSBN's Strategic Weapon System (SWS) and crew before operational deployment following the submarine's engineered refueling overhaul.

"The DASO test, and others like these, underscore our readiness and capability for 21st Century Strategic Deterrence," said Rear Adm. Thomas E. Ishee, U.S. Strategic Command's director of Global Operations. "SSBN crews undergo constant training and regularly planned testing to ensure the weapons systems remain ready and reliable. The Sailors and support element who make up the silent service prove every day they are capable and prepared to protect America and its allies."

This launch marks 184 successful missile test flights of the Trident II (D5 & D5LE) SWS.

“Today’s [Sept. 17] test demonstrates the unmatched reliability of our sea-based nuclear deterrent, which is made possible by a dedicated team of military, civilian and industry partners who bring expertise and dedication to the mission that is truly extraordinary,” said Vice Adm. Johnny R. Wolfe, director of the Navy’s Strategic Systems Programs. Further, “This same team is now developing the next generation of the Trident Strategic Weapon System, which will extend our sea-based strategic deterrent through 2084.”

The Trident strategic weapon system is highly accurate and reliable, according to the release. The Trident II (D5) missiles recently underwent a life extension program to address potential impacts from aging and obsolescence. The life-extended missiles – Trident II (D5LE) – are now being deployed to the Fleet and will serve for the remaining service life of U.S Ohio-class and United Kingdom Vanguard-class SSBNs, and as the initial load-out for the U.S. Columbia-class and U.K. Dreadnought-class SSBNs.

USS Maine (SSBN 741) successfully executed the Navy’s last DASO in February 2020 off the coast of San Diego, California. The Navy’s most recent flight test – a Commander’s Evaluation Test – was a series of four launches in February 2021 off the coast of Florida. Each of these flight tests were of the life-extended Trident II (D5LE) missiles.

Flight test missiles are not armed, and safety of the public and the crew conducting the mission is paramount, the release stated. The launches were conducted from the sea, the missile flew over the sea and landed in the sea. At no time did the missile fly over land.

The missile test was not conducted in response to any ongoing world events, nor as a demonstration of power. Test launches – including DASOs – are scheduled years in advance.

A credible, effective nuclear deterrent is essential to our

national security and the security of U.S. allies. Deterrence remains a cornerstone of national security policy in the 21st century.

Strategic Systems Programs is the Navy command that provides cradle-to-grave lifecycle support for the Navy's strategic weapon systems. This includes training, systems, equipment, facilities and personnel responsible for ensuring the safety, security- and effectiveness of the nation's Submarine Launched Ballistic Missile (SLBM) Trident II (D5LE) strategic weapon system.

SLBMs are the sea-based leg of the nation's strategic nuclear deterrent Triad that also includes the U.S. Air Force's intercontinental ballistic missiles (ICBM) and nuclear-capable bombers. Each part of the Triad provides unique capabilities and advantages.

The sea-based leg makes up the majority – approximately 70% – of the U.S.'s deployed strategic nuclear deterrent Triad. The SLBM is the most survivable leg of the triad, provides a persistent presence, and allows for flexible concepts of operations.

SECNAV Impressed with Improvements in Surface Warfare Training

Secretary of the Navy Carlos Del Toro gives remarks during an event at the International Seapower Symposium. *U.S. NAVY / Chief Mass Communication Specialist Nicholas Brown*

ARLINGTON, Va. – Just five weeks into his tour as secretary of the Navy (SECNAV), Carlos Del Toro has checked up on the training and readiness of the Navy's surface warfare ship crews and likes what he sees.

"Crew readiness and training is incredibly important. It is the utmost responsibility of the commanding officer at sea, and I would argue that it is the utmost responsibility of the secretary of the Navy in the Pentagon," Del Toro said, speaking Sept. 17 at a media virtual roundtable after his return from Newport, Rhode Island, where he attended the 24th International Seapower Symposium.

As a former destroyer commanding officer, Del Toro was asked by *Seapower* about whether he had concerns about issues with surface warfare crew training and readiness that came to light in 2017 with the collisions of the Arleigh Burke-class guided-missile destroyers USS Fitzgerald and USS John McCain, both of which resulted in the deaths of crew members.

"I've taken a hard look at this over the last five weeks," the SECNAV said. "I've even gone up to Surface Warfare Officers School as well to meet with the leadership and junior officers up there. I have a lot of experience in this arena being a former commanding officer that sailed in those Pacific waters.

"I am overly impressed with the major investments that have been made subsequent to those two horrific disasters that we had," he said. "It's really apparent to me that the entire surface community has come together – I would argue that the entire Navy has come together – in very serious ways with major, major investments in technology, in training [and] in trying to understand the cultural impacts of decisions that have been made in the past on the surface warfare community. We have come out of this like a shining star. When I look at the professionalism of our junior officers, our mid-grade officers today, the changes that were made to the executive

officer pipeline [and] commanding officer pipeline, I have really been blown away these past two weeks, really taking a deep dive into all those issues."

Del Toro said that while in Newport this week he "spent a substantial amount of time up there taking a look at their curricula, their training, their simulators. For example, just alone in the world of simulators for their training – the pilot house, the combat information center – it was so impressive."

The SECNAV said that he is "really of the belief that we've come a long way here and that we have largely corrected the deals of the past that have been made and we're on the right path moving forward. And of course, we will continue to give this our utmost attention because the safety and the effect of our operation of out Navy vessels is of utmost importance."

Ingalls Shipbuilding Completes Acceptance Trials for DDG Frank E. Petersen Jr.

Frank E. Petersen Jr. (DDG 121) navigates in the Gulf of Mexico during bravo trials. *HUNTINGTON INGALLS INDUSTRIES*
PASCAGOULA, Miss. – Huntington Ingalls Industries' Ingalls Shipbuilding division has completed the final round of sea trials for Arleigh Burke-class guided missile destroyer Frank E. Petersen Jr. (DDG 121), the company announced Sept. 17.

"The successful completion of acceptance trials is an extremely rewarding accomplishment for Ingalls and for our

partners who work closely with us to ensure we achieve this milestone together," Ingalls Shipbuilding President Kari Wilkinson said. "We are proud of our shipbuilders for working as a team to move DDG 121 one step closer to delivery."

DDG 121 is named for Frank E. Petersen Jr., the U.S. Marine Corps' first African-American aviator and general officer. After entering the Naval Aviation Cadet Program in 1950, Petersen would go on to fly more than 350 combat missions during the Korean and Vietnam wars.

Ingalls has delivered 32 destroyers to the Navy and currently has four more under construction including Lenah Sutcliffe Higbee (DDG 123), Jack H. Lucas (DDG 125), Ted Stevens (DDG 128) and Jeremiah Denton (DDG 129).

Arleigh Burke-class destroyers are highly capable, multi-mission ships and can conduct a variety of operations, from peacetime presence and crisis management, to sea control and power projection. The guided missile destroyers are capable of simultaneously fighting air, surface and subsurface battles. The ship contains a myriad of offensive and defensive weapons designed to support maritime defense well into the 21st century.

Foundation Honors Sen. John Warner, Premieres Film About Elvis's Contribution to USS

Arizona Memorial

The promotional poster for the new film about Elvis Presley's fundraising efforts for the USS Arizona Memorial. *WORLD WAR II FOUNDATION*

The World War II Foundation held a world premiere for its newest production, "Elvis and the USS Arizona," and honored the late Sen. John Warner at the Kennedy Center in Washington, D.C. this past week.

Warner received the foundation's Senator Bob Dole World War II Leadership Award, presented annually to "an individual of the Greatest Generation or their family who as an individual reflects the values of self-sacrifice, public service and everlasting commitment to our nation's principles of freedom and democracy."

The presentation was made to Warner's wife, Jeanne, by Secretary of Veterans Affairs Denis McDonough, with keynote remarks by Chairman of the Joint Chiefs of Staff Gen. Mark Milley. CNN's Jake Tapper served as master of ceremonies.

The film, produced by Tim Gray and narrated by Jim Nantz with Kyle Chandler, will air on public televisions this fall. It recounts the contribution made by the wildly popular performer, Elvis Presley, and his sold-out performance on March 25, 1961, at Bloch Arena on Naval Station Pearl Harbor to raise money to complete the USS Arizona Memorial. Presley was in Hawaii filming his movie, "Blue Hawaii."

The Elvis Presley benefit raised over $60,000 for the USS Arizona Memorial and brought awareness of the fundraising effort. The memorial was completed and officially dedicated in 1962. Presley would visit the Arizona Memorial every time he performed in Hawaii.

Today, the USS Arizona Memorial is the most visited location

in Hawaii, thanks in large part to Elvis Presley.

The mission of the nonprofit World War II Foundation is to tell the personal stories of those who were swept up in the most devastating conflict known to man and make these films accessible for free to students, educators, classrooms and the global public.

“Our documentaries rank in the top five of most requested programs nationally on American Public Television stations,” said Gray.