NAVAL AVIATION NEWS

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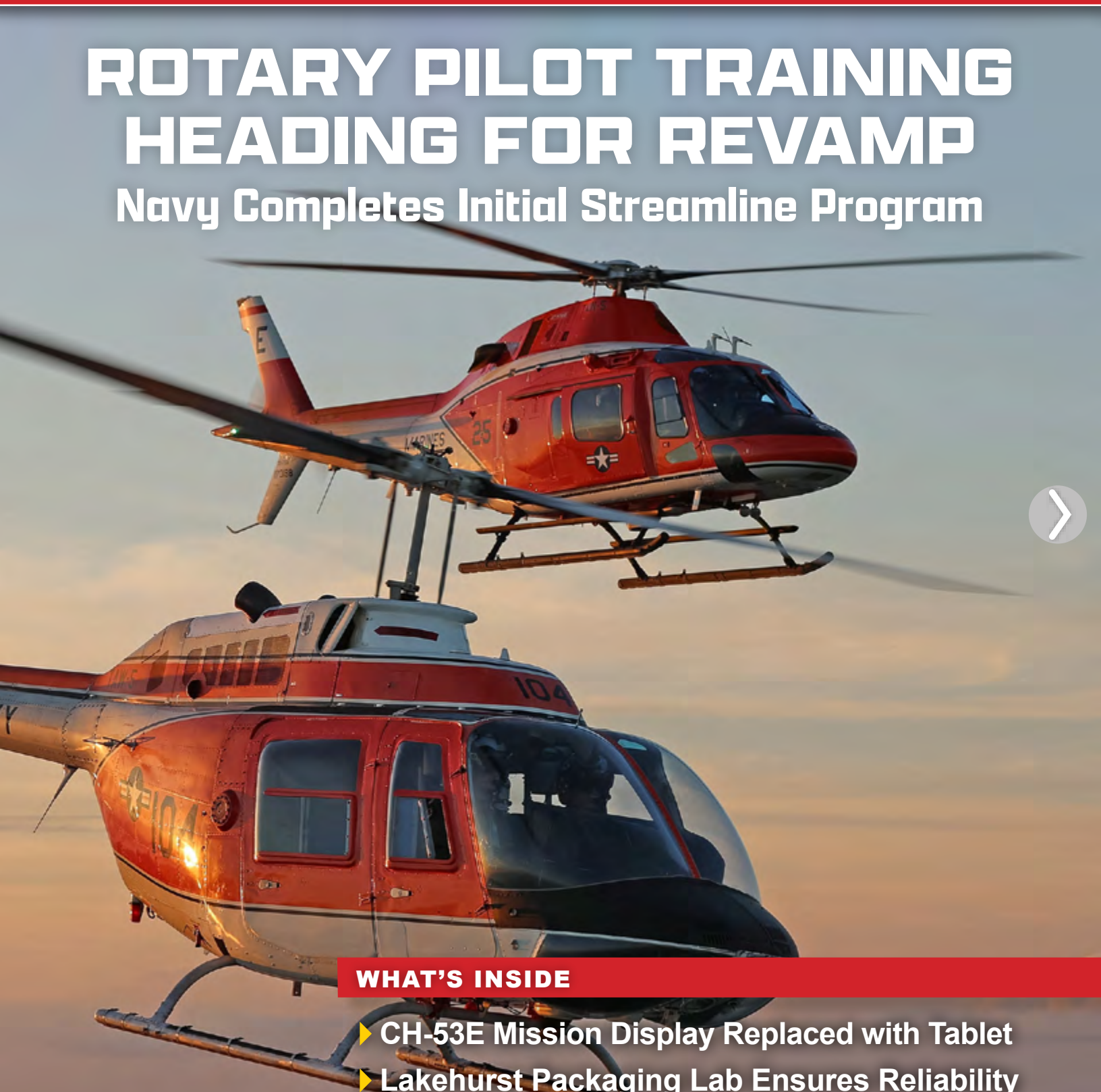
ROTARY PILOT TRAINING HEADING FOR REVAMP

Navy Completes Initial Streamline Program



WHAT'S INSIDE

- CH-53E Mission Display Replaced with Tablet
- Lakehurst Packaging Lab Ensures Reliability
- UAV Path-Finding Tested in Arctic Circle

The Wasp-class amphibious assault ship USS Bataan (LHD 5) sails in the Mediterranean Sea, Dec. 31, 2023.

U.S. Navy photo by MC2 Nolan Pennington

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ON THE COVER

On the Cover: *A Navy TH-57C Sea Ranger and a Navy TH-73A Thrasher, assigned to Training Air Wing Five (TAW-5) and flown by instructors from Helicopter Training Squadron 8 (HT-8), Helicopter Training Squadron 18 (HT-18), and Helicopter Training Squadron 28 (HT-28), fly over Pensacola, Florida, on Tuesday, Sept. 12, 2023. (U.S. Navy photo by Antonio More).*

In this issue of Naval Aviation News, *we report on the Navy's new approach to helicopter pilot training by streamlining potential pilots' time in aircraft and simulators to a rotary-only pipeline, aiming to churn out qualified helicopter pilots at a faster rate. Read about this new approach starting on page 20. On page 24, read how the H-53 Heavy Lift Helicopters Program Office CH-53E Mission Data Extender team recently installed the first off-the-shelf tablet as a primary mission display, an effort that saved both time and money. Unmanned aerial vehicles (UAVs) recently hit a new milestone after testing cutting-edge, flight-path planning software in one of the most challenging environments on earth—the Arctic Circle. Read about the Naval Postgraduate School and Naval Research Laboratory efforts in this area on page 36. And on page 26, learn how the Packaging, Handling, Storage and Transportation (PHS&T) lab at Naval Air Warfare Center Aircraft Division Lakehurst tests packaging material and containers for shipping Navy resources safely worldwide.*

On the back cover: *U.S. Marine Cpl. Gavin Porter, left, a crew chief, and Cpl. Julius Dugay, a flight line mechanic with the 22nd Marine Expeditionary Unit, assemble a CH-53E Super Stallion engine fuel control in the hangar bay of the Wasp-class amphibious assault ship USS Kearsarge (LHD-3). (U.S. Marine Corps photo by Sgt. Aaron Henson)*

The U.S. Navy's Oldest Periodical, Established 1917

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Commands may send news and announcements such as awards, rescues, milestones and other achievements to **navy_nannews@navy.mil**. Approved photos of Naval Aviation-oriented activities are always welcome. For longer feature articles, contact the editor in advance. Military contributors should forward articles about their commands only after internal security review and with command approval. For more information, contact us at **navy_nannews@navy.mil**.

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Flightline

TACAMO Celebrates Women in Naval Aviation

A Q&A with Cmdr. Rebecca Anderson

By Kathy Hieatt

The year 2023 marked the 50th anniversary of women in Naval Aviation, an anniversary that celebrated when the first women began flight school in Pensacola, Florida, back in 1973.

In the years since those "first six" donned their flight suits, women's role in Naval Aviation has expanded to serve and lead in every aspect of the enterprise.

A lesser-known part of this history is the role that women have played in support of the Take Charge and Move Out (TACAMO) mission, which links the president and secretary of defense with naval ballistic missile forces during times of crisis. Throughout the years, TACAMO has been ahead of the curve in its inclusion and promotion of women, said Vern Lochausen, a retired commodore and longtime member of the TACAMO community who now serves as a consultant for the Airborne Strategic Command, Control and Communications Program Office.

As far back as 1989, women made up roughly one-fourth of the operational squadrons that fly the TACAMO mission, according to an April 1989 article in Proceedings magazine. They helped pave the way for women in other aviation communities and advocate for women to be allowed to serve in combat.

Among them were women such as the first TACAMO squadron pilots, Lt. Janine Igou and Lt. Sue Harter. TACAMO women also included Vice Adm. Nora Tyson, the first woman to command a carrier strike group and the first to serve as 3rd Fleet commander; Rear Adm. Margaret "Peg" Klein, the first woman commandant of midshipmen at the U.S. Naval Academy; and Vice Adm. Robin Braun, the first woman to command the U.S. Navy Reserve.

Today, that tradition is carried on by the women still serving the TACAMO mission, including those at Naval Air Systems Command's Airborne Strategic Command, Control and Communications Program Office. The program office is an acquisition command that delivers capabilities to the warfighter by maintaining the E-6B Mercury fleet. It is also fielding the next generation of TACAMO aircraft through the TACAMO Recapitalization Program, E-XX. The program office's mission is to deliver and support survivable, reliable and endurable airborne command, control and communications for the president, secretary of defense and U.S. Strategic Command.

They include Cmdr. Rebecca Anderson, military assistant program manager for logistics (APML). Anderson, a native of Catonsville, Maryland, enlisted in the Navy 20 years ago, working in maintenance and logistics and earning her officer commission in 2010. She joined the program office at Naval Air Station Patuxent River, Maryland, in 2022.

She has made an indelible impact on the E-6B Mercury fleet's depot re-

form, leading the team to reduce turnaround time from 595 days to 372 days.

For the 50th anniversary of women in Naval Aviation, Anderson answered some questions about her journey as part of the Naval Aviation community.

Why did you join the Navy?

I joined the Navy because I was bored as a teacher, where I taught various computer courses at an adult technical school. They were short, six-week-long classes and, despite enjoying the interactions with the students, the material was the same, again and again. I have always loved to travel and felt the military would provide that opportunity.

Why did you decide to pursue a career in naval maintenance and logistics?

I began my Navy career as an avionics technician. My dad worked for the airlines and I grew up with a fascination of airplanes. My first command was the Aircraft Intermediate Maintenance Department at Naval Air Station Oceana in Virginia Beach, Virginia, where I learned to run and fix gear across maintenance benches. It wasn't until I deployed for the first time aboard the aircraft carrier USS George Washington (CVN 73) that I truly fell in love with what I do. I'm passionate about doing things that make a difference. I may have had a very small part in the overall mission, but I knew that I contributed and wanted to have a bigger role. I looked at the leaders around me and began to research earning a commission. I applied to Officer Candidate School in 2009 while on deployment on the aircraft carrier USS Dwight D. Eisenhower (CVN 69) and, thankfully, was selected upon my first submission.

What's been your favorite job in your naval career so far?

Serving as the maintenance office at Strategic Communications Wing 1 (SCW-1) at Tinker Air Force Base, Oklahoma. It was the first position I held where I felt I made a difference on the larger scale as I'd dreamed of doing as a young second class petty officer. I love the TACAMO mission. In this role, I briefed the SCW-1 commodore regularly on the status of our aircraft and improvement initiatives.

Have you had any mentors along the way?

My first mentor was Cmdr. Mike Barriere. He was the maintenance material control officer on the USS Dwight D. Eisenhower (CVN 69) and was instrumental in my selection as an aviation maintenance duty officer. He also came to Naval Station Newport, Rhode Island, for my commissioning and continued to mentor me until he retired. Capt. Michael Mulhern is my current mentor. He was instrumental in my growth as a young lieutenant on the aircraft carrier USS Harry S. Truman (CVN 75) and continued to mentor me from afar through my lieutenant commander tours and selection for commander.

What led you to join the TACAMO community?

I knew of others who had been in TACAMO. I looked up the "doomsday plane" on YouTube and was fascinated by what I learned. Once I was in place as the wing maintenance officer at SCW-1, I never looked back. I have worked to develop the path I am currently on to continue my support of this critical national security mission.

What's your day-to-day like as the APML for the Airborne Strategic Command, Control and Communications Program Office?

As the military APML, I conduct and attend a lot of meetings. That may sound monotonous, and some days it can be, but most days I'm leading a team of teams to resolve issues in the fleet or the depot line. The teams I work with are filled with a wealth of knowledge and expertise. I collaborate with them to find the best paths

Cmdr. Rebecca Anderson, the military assistant program manager for logistics at Naval Air Systems Command's Airborne Strategic Command, Control and Communications Program Office.

U.S. Navy photo

forward and deliver solutions to the fleet, ensuring that they can continue to execute their mission. These teams include people from NAVAIR, the Fleet Support Team, SCW-1, Boeing, our contractor logistics support provider, Boston Consulting Group, Northrup Grumman and more.

What's your favorite part of your job?

I enjoy working with the teams to drive us forward toward our common goal of aircraft readiness.

What skills and/or traits have helped you be successful in your career?

Humility and relationship development. My enlisted time spanned just short of seven years. I have never turned a wrench on an aircraft, and yet I have led maintenance efforts on multiple platforms: the F/A-18 Super Hornet, E-2D Advanced Hawkeye, P-8A Poseidon, H-60 Seahawk and the E-6B Mercury. I have humbled myself and built relationships with maintenance experts, and I owe any success to them. Leading teams of teams, the path forward can be both dynamic and challenging. Listening to each entity and understanding the different constraints and implications has been essential.

Have you faced any unique challenges as a woman in the Navy?

I have never felt discrimination in the Navy. In my experience, those who work hard are part of the team and instrumental to mission accomplishment, regardless of their gender.

Do you have any advice for women who want to pursue a career in the Navy and/or Navy logistics and maintenance?

Do it. Do your job. Work hard. Let your work speak for itself. I offer that same advice to anyone wanting to pursue a naval career.

With 2023 marking the 50th anniversary of women in Naval Aviation, what do you think about the contributions that women have made to the Naval Aviation Enterprise (NAE) over the last 50 years?

I am thankful to be here and contribute to the NAE mission. I understand there have been women who have paved the way for the opportunities I have had in my career.

Is there anything else you would like to share?

I'm looking forward to the day when each individual is valued for their accomplishments and demographics are not part of the narrative. I want my work to simply speak for itself.

Airborne Strategic Command, Control and Communications Program Office consultant Vern Lochausen contributed to this report.

Kathy Hieatt is a public affairs officer with the Airborne Strategic Command, Control and Communications Program Office.

U.S. Navy photo

Cmdr. Rebecca Anderson is a native of Catonsville, Maryland, and a graduate of Saint Leo University. She began her naval career in 2003, enlisting as an Aviation Electronics Technician. After graduating from Recruit Training Command, she attended Naval Aviation Technical Training Center (NATTC) Pensacola, and subsequently reported to Aircraft Intermediate Maintenance Department (AIMD, now Fleet Readiness Center) onboard Naval Air Station Oceana. She completed her Bachelor of Arts and Master of Business Administration degrees while there and deployed onboard USS George Washington and USS Dwight D. Eisenhower before her selection to Officer Candidate School. Upon commissioning in 2010, she was designated as an Aerospace Maintenance Duty Officer.

Anderson's commissioned operational assignments include Strike Fighter Squadron (VFA) 213, USS Harry S. Truman, Air Test and Evaluation Squadron (VX) One, Strategic Communications Wing (SCW) One, Fleet Air Reconnaissance Squadron Three, and Naval Air Systems Command. During these tours, she participated in Operations Enduring Freedom and New Dawn onboard USS George H. W. Bush and USS Harry S. Truman. She held various positions, including Division Officer, Material Control Officer (MCO), Quality Assurance Officer (QAO), Maintenance Material Control Officer (MMCO), Assistant Maintenance Officer (AMO), Maintenance Officer (MO), and currently serves as the Military Assistant Program Manager for Logistics (APML) supporting the E-6B TACAMO mission.

Anderson earned her Professional Aviation Maintenance Officer Wings and has been awarded the Navy and Marine Corps Commendation Medal (four awards), Navy and Marine Corps Achievement Medal (four awards), and Battle Efficiency Award (Command Award).

Grampaw Pettibone

Gramps from Yesteryear: January/February 2004

Illustration by Ted Wilbur

Shucks and Flashlights

An instructor pilot was scheduled for three flights in one day in a T-34C. Upon completion of the first flight, the aircraft landed at home field as planned and was refueled. During the preflight inspection of the Turbo-Mentor for the next sortie, the instructor discovered fluid on the cowling. He asked maintenance to check for a possible leak. A mechanic looked over the engine area and stated there was no problem and the aircraft was ready for launch.

The pilot took off and flew the next flight to another air base. Upon landing, the pilot was advised to call his home air station regarding a possible problem. He did and was told the mechanic who had checked out the fluid on the cowling was missing his flashlight and that the instructor needed to examine the engine area for the missing item.

The pilot looked inside the engine compartment for the flashlight but was unable to locate it. The mechanic recommended the pilot check again and pay special attention to the area above the engine. The pilot returned to the aircraft and this time found the flashlight. It had become jammed against the overhead of the engine section. It was removed and the pilot continued with a safe flight.

Grampaw Pettibone says…

Anyone familiar with Louis L'Amour western novels knows the phrase "light a shuck," which refers to the husk around Indian corn that frontier folks lit to help them find their way home after dark. They kept pretty good track of those shucks, so vital were they to their well being. Flashlights are the shucks of today and no less important.

Bravo Zulu to the mech who owned up to missing his flashlight, albeit belatedly. As to the pilot's preflight inspection, he lucked out. Had the missing item jarred loose it could have raised holy you-know-what with the power plant. Bet that pilot has elevated his preflight focus of the engine area, and that's a plus.

Gramps thanks Lt. Cmdr. John E. Valentine, (Ret.)U.S. Coast Guard, for contributing this story.

Airscoop

Compiled by Rob Perry

U.S. Marine Corps photo by Warrant Officer Akeel Austin

Two U.S. Marine Corps F-35B Lightning II jets with Marine Fighter Attack Squadron (VMFA) 542 taxi at Marine Corps Air Station Cherry Point, North Carolina, Dec. 28, 2023.

VMFA-542 Becomes First F-35B Operational Squadron on East Coast to Achieve IOC

MARINE CORPS AIR STATION CHERRY POINT, N.C.—Marine Fighter Attack Squadron (VMFA) 542, 2nd Marine Aircraft Wing (MAW), on Feb. 5 became the first East Coast F-35B Lightning II Joint Strike Fighter squadron in the Fleet Marine Force to achieve initial operational capability.

Initial operational capability means that VMFA-542 has enough operational F-35B Lightning II aircraft, trained pilots, maintainers and support equipment to self-sustain its mission essential tasks (METs). These METs include conducting close-air support, offensive anti-air warfare, strike coordination and reconnaissance and electronic attacks.

"VMFA-542 is the first operational fifth-generation squadron in II Marine Expeditionary Force, giving the aviation combat element the most lethal, survivable and interoperable strike fighter in the U.S. inventory," said Lt. Col. Brian Hansell, commanding officer of VMFA-542. "The F-35B is unmatched in its capability to support Marines against the advanced threats that we can expect in the future."

The F-35 is a fifth-generation fighter jet with advanced stealth, agility and maneuverability, sensor and information fusion and provides the pilot with real-time access to battlespace information. It is designed to meet an advanced threat while improving lethality, survivability and supportability. The F-35B Lightning II is the short-takeoff and vertical-landing F-35 variant. This capability allows the aircraft to operate from amphibious assault ships and expeditionary airstrips less than 2,000 feet long.

"I am extremely proud of the Marines and Sailors of VMFA-542," said Col. James T. Bardo, commanding officer of Marine Aircraft Group 14, the parent command of VMFA-542. "Achieving initial operational capability at the pace and precision of which they did truly demonstrates what an exceptional unit this is. This milestone demonstrates their hard work ingenuity, and perseverance."

Achieving initial operational capability also means that VMFA-542 is one step closer to achieving full operational capability and completing its F-35B Lightning II transition, a process that began in December 2022.

VMFA-542 is a subordinate unit of 2nd MAW, the aviation combat element of II Marine Expeditionary Force.

Written by 2nd Lt. John Graham with the 2nd Marine Aircraft Wing.

Tactical Resupply UAS Ready for the Fleet

PATUXENT RIVER, Md.—The Navy and Marine Corps announced Initial Operational Capability (IOC) Oct. 27 for the TRV-150C Tactical Resupply Unmanned Aircraft System (TRUAS) at Marine Corps Base Hawaii.

The first six production systems arrived last week at the Marines Third Littoral Logistics Battalion (LLB-3) in Kaneohe Bay, Hawaii, which means that LLB-3 is sufficiently manned, trained and ready to deploy with the TRV-150C.

"This achievement means the fleet is ready and fully capable of deploying and using this game-changing system, which will enable Marines to perform forward deployed contested logistics missions," said Gregg Skinner, Navy and Marine Corps Small Tactical Unmanned Aircraft Systems program manager, whose Unmanned Logistics Systems-Air (ULS-A) team oversees the TRUAS program.

Prior to declaring IOC, support staff from the Air Test and Evaluation Squadron (UX) 24 from Naval Air Warfare Center Webster Outlying Field in Maryland arrived at MCB Hawaii along with an instructor from the Training and Logistics Support Activity Pacific, to conduct final operator qualification with LLB-3. After reviewing the differences between prototype and production systems, the trainers and operators successfully completed 36 training flights to ensure that the unit was ready to deploy.

The program office awarded the production contract for the TRV-150C in April 2023 following a rapid prototyping initiative that brought the system from inception to the fleet in less than four years.

"This was a total team effort in accomplishing this milestone in record time," Skinner said. "Special thanks to the program office team, Training and Logistics Support Activity Pacific, Air Test and Evaluations Squadron 24 and the Service Engineering Company (TRUAS prime contractor) for their hard work and dedication aimed at getting this much needed Force Design 2023 capability in the hands of the warfighter."

TRUAS is a land-based, autonomous UAS that provides organic logistics to Marine squads through automated launch, waypoint navigation, and automated landing and payload drop. The system provides battlefield logistics capability to distribute critical supplies at Expeditionary Advanced Bases, where the risk to manned aircraft would deny manned aviation resupply operations out to the last tactical mile.

"The contested logistics environment challenges the ability of our Marines to distribute necessary supplies to the right place at the time of need," said Col. Aaron Angell, Logistics Combat Element Division director. "TRUAS gives a logistics unit the organic ability to immediately respond with a precision ground launched air delivery system. This is leap-ahead technology that we will learn to continue to shape future unmanned aerial logistics platforms."

From the Navy and Marine Corps Small Tactical Unmanned Aircraft Systems Program Office.

U.S. Marine Corps Photo by Lance Cpl. Kayla LeClaire

The Tactical Resupply Unmanned Aircraft System (TRUAS) flies during a demonstration at DZ Cockatoo on Marine Corps Base Quantico, Virginia, March 29, 2023.

Team Starts Test Launches for Future Aircraft Carrier

NEWPORT NEWS, Va.—U.S. Navy and industry partners worked together Feb. 14 to launch the first deadloads from the flight deck of Pre-Commissioning Unit (PCU) John F. Kennedy (CVN 79).

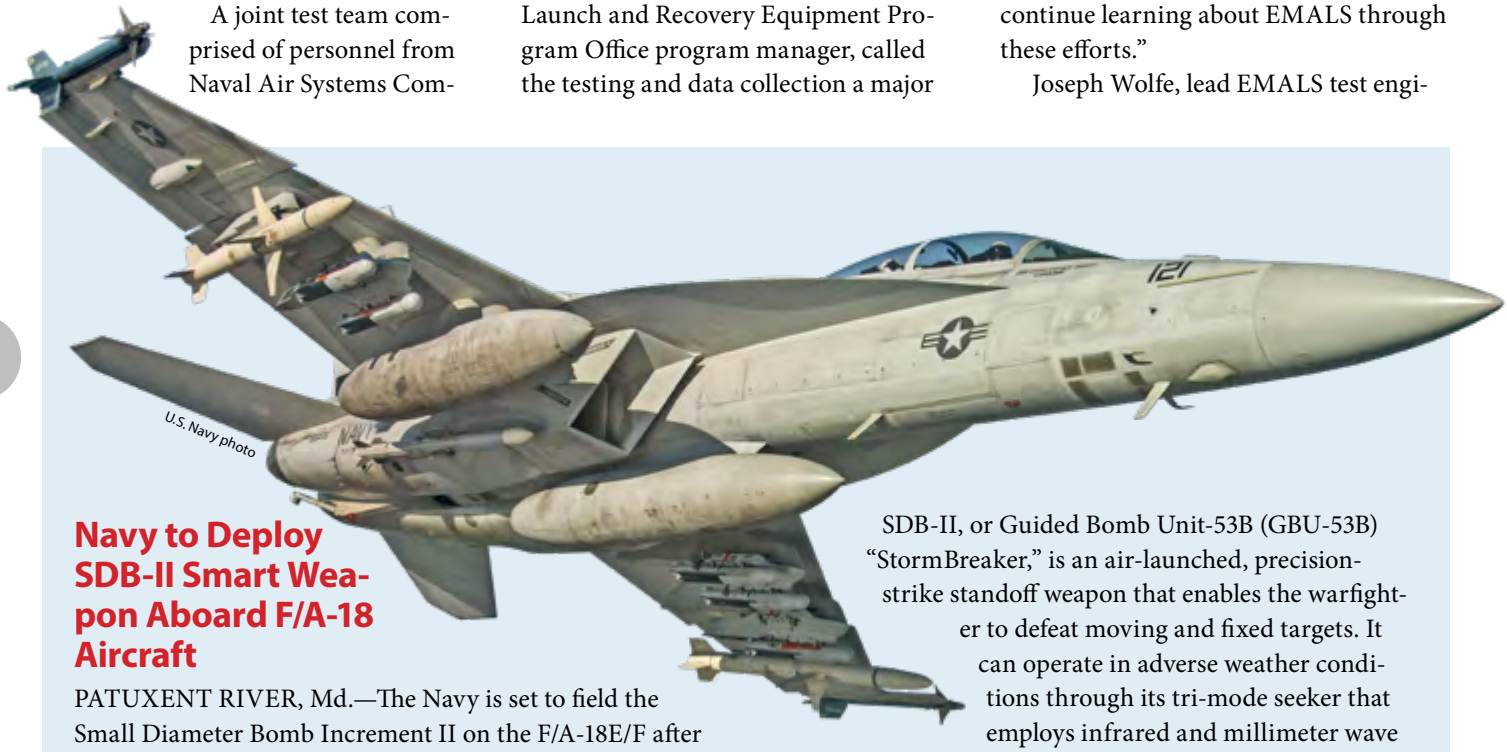
The deadload testing yielded important performance data for the ship's Electromagnetic Aircraft Launch System (EMALS) and marked the first of many test launches from the carrier as its Aircraft Launch and Recovery Equipment (ALRE) is commissioned.

A joint test team comprised of personnel from Naval Air Systems Command (NAVAIR), Huntington Ingalls Industries (HII), Supervisors of Shipbuilding, Conversion and Repair (SUPSHIPs), General Atomics (GA) and Carrier and Field Service Unit (CAFSU) used one of the ship's catapults to launch 9,000 to 80,000 pound carts simulating aircraft into the James River. With valuable data in hand, the team is planning and preparing for future testing on the ship's four catapults.

Capt. Michael Kline, the Aircraft Launch and Recovery Equipment Program Office program manager, called the testing and data collection a major accomplishment for the launch and recovery community, industry partners and the Navy.

"The successful second installation of Ford-class launch and recovery equipment promises CVN-79 the same advantages USS Gerald R. Ford (CVN 78) utilized on her first operational deployment in 2023," Kline said. "The joint team expertly conducted the test, collected valuable data and identified new areas for research. We're excited to continue learning about EMALS through these efforts."

Joseph Wolfe, lead EMALS test engi-



U.S. Navy photo

Navy to Deploy SDB-II Smart Weapon Aboard F/A-18 Aircraft

PATUXENT RIVER, Md.—The Navy is set to field the Small Diameter Bomb Increment II on the F/A-18E/F after declaring Early Operational Capability (EOC) in October.

The F/A-18E/F is the Navy's first platform to carry the SDB-II, giving the aircraft the capability to hit moving targets in harsh weather and address targets in dynamic scenarios.

"The Navy and Air Force team, along with the test community and fleet stakeholders, worked relentlessly to expedite the fielding of this weapon," said Tyler Alt, Navy SDB-II program manager. "This weapon will give our warfighters a much-needed capability and provide the basis for future network enabled weapons."

The team will complete two additional operational test events before achieving Initial Operational Capability (IOC) in 2024.

SDB-II, or Guided Bomb Unit-53B (GBU-53B) "StormBreaker," is an air-launched, precision-strike standoff weapon that enables the warfighter to defeat moving and fixed targets. It can operate in adverse weather conditions through its tri-mode seeker that employs infrared and millimeter wave radar to see through fog, smoke and rain.

The weapon has the capability to receive updated target coordinates mid-flight via two-way datalink communications. Using these network options, SDB-II allows airborne or ground controllers the ability to send in-flight target updates.

SDB-II is a Joint-Interest, Air Force-led program and is fielded on the Air Force's F-15E aircraft. SDB-II will also be compatible and fielded on F-16C/D and F-35 aircraft.

The Navy component of the SDB-II program is executed by the Precision Strike Weapons Program Office, which provides Naval Aviation with dominant lethal, integrated precision strike solutions for any conflict anytime, anywhere.

From the Precision Strike Weapons Program Office.

"EMALS for John F. Kennedy also bears all the same improvements delivered to CVN-78, including several Engineering Change Proposals, software upgrades, and knowledge garnered from testing and deployment."

neer, has worked on the EMALS program for 18 years, supporting the technology from its inception and development to its installation and use on Gerald R. Ford. Today, he leads many commissioning processes for EMALS on John F. Kennedy.

"It's hard to describe how rewarding this process is," Wolfe said. "Nearly 20 years ago, our team was very small, working long hours, and under a tremendous amount of pressure to bring success to a program we knew would be monumental for the U.S. Navy. Fast forward to where we are now, not only did we commission 78, but she finished her deployment with great success, and we can bring that success to [CVN] 79—that's beyond rewarding."

Wolfe and the EMALS test team utilized all the lessons learned from Ford's first operational deployment as they began testing for EMALS on John F. Kennedy. Additionally, EMALS test efforts benefit from the collective knowledge of John F. Kennedy's Ships Force who are already trained on Ford-class launch and recovery systems.

EMALS for John F. Kennedy also bears all the same improvements delivered to CVN-78, including several Engineering Change Proposals, software upgrades, and knowledge garnered from testing and deployment.

"We re-wrote our certification manual based on the lessons we learned on CVN-78, and incorporated them into appendices and procedures for CVN-79. It was a lot smoother from that perspective," Wolfe said.

Cmdr. Jocelyn Liberg, deputy program manager for Ford CVNs, said ALRE's progress on John F. Kennedy is the product of years of dedication and expertise.

"As we test our Ford-class systems on the second CVN of its class, we have the opportunity to pull from many lessons learned since the first EMALS deadload testing for CVN-78 in 2015," Liberg said. "Nearly a decade later, we're continually building on that experience and ensuring our warfighters have the tools they need."

From the Aircraft Launch and Recovery Equipment Program Office.

U.S. Navy photo

Sailors assigned to the Pre-Commissioning Unit John F. Kennedy (CVN 79) work alongside HII and Naval Air Systems Command counterparts during the first "dead-load" testing of the electromagnetic aircraft launch system. In this phase of testing, large, wheeled, car-like structures of graduated weights up to 80,000 pounds to simulate the weight of actual aircraft are launched off the carrier's bow into the James River.

U.S. Navy photo by Airman Tyler T. Crowley

An F-35C Lightning II from Strike Fighter Squadron (VFA) 147 prepares to take off from the flight deck of Nimitz-class aircraft carrier USS George Washington (CVN 73). George Washington is underway in support of carrier qualifications.

Embarked Airwing Conducts F-35C Cyclic Operations Aboard George Washington

ATLANTIC OCEAN—Nimitz-class aircraft carrier USS George Washington (CVN 73) and embarked Carrier Airwing (CVW) 7 completed carrier qualifications and cyclic flight operations Dec. 12 while underway in the Atlantic Ocean.

Having previously focused on carrier qualifications, George Washington transitioned to cyclic operations to simulate future operational missions. This milestone marks the first time an aircraft carrier operating in the Atlantic Ocean conducted cyclic operations utilizing the F-35C Lightning II.

"Working to integrate with the 'Team Freedom' Airwing demonstrates that our warship continues to meet critical milestones in preparation for conducting global operations," said George Washington's Commanding Officer Capt. Brent C. Gaut. "I am exceptionally proud of our crew for making history during this underway period. Together, our 'GW' Team and family continue to highlight the U.S. Navy's profound operational capabilities, while also strengthening and empowering the future of Naval Aviation."

Over three days of cyclic flight operations the crew conducted 141 sorties, 67 day traps, and 17 night traps with brief pauses to allow for maintenance and fueling. While in the air, pilots completed various exercises, from close air support of troops on the ground to air-to-air maneuvers. Once the pilots successfully demonstrated tactical proficiency, they landed on the flight deck and prepared to launch again.

"These operations test our current capabilities and help the airwing and ship's crew integrate to accomplish safe and effective operations from the sea," said Capt. Alex Hampton, commander of CVW-7. "It is a synchronized effort that allows us to project power from the sea, maintain a dynamic and proficient level of readiness to meet emerging missions, and deter potential adversaries. It also provided the crew the opportunity to operate with first-of-its-kind aircraft. F-35Cs are extremely versatile, able to complete a wide variety of missions that would've required multiple aircraft before."

The fifth generation F-35 Lightning II integrates advanced stealth technology into a highly agile, supersonic aircraft that provides the pilot with unprecedented situational awareness and unmatched lethality and survivability. While at sea, Team Freedom focused on integrating the aircraft with the ship's crew both on the flight deck and in the hangar bay.

"This underway saw the Argonauts return to the cyclic carrier environment for the first time since returning from deployment last year," said Cmdr. Christopher Case, commanding officer of Strike Fighter Squadron (VFA) 147. "It gave us an invaluable opportunity to integrate and operate with the George Washington and CVW-7 teams for the first time. I am proud of the incredible work the Sailors of VFA-147 accomplished in just a short period of time, and look forward to continued integration opportunities."

Embarked squadrons of CVW-7 included VFA-147 "Argonauts," Strike Fighter Squadron (VFA) 103 "Jolly Rogers," Electronic Attack Squadron (VAQ) 140 "Patriots," Helicopter Sea Combat Squadron (HSC) 5 "Nightdippers," and Helicopter Maritime Strike Squadron (HSM) 46 "Grandmasters."

Written by Seaman Apprentice Geoffrey Ottinger with USS George Washington public affairs.

NAWCAD Demonstrates First-Ever Critical Safety Item for F/A-18 Using Additive Manufacturing

PATUXENT RIVER, Md.—The legacy F/A-18 Hornet's primary bleed air pressure regulating and shutoff valve is a critical safety item for the aircraft with a long lead time of more than 800 days. The valve is experiencing multiple wear issues, causing the parts to be removed from service prematurely. The original part is manufactured via casting, which is time consuming and expensive resulting in supply backlog issues. In 2019, the Naval Air Systems Command (NAVAIR) Reliability Control Board listed the part as the 11th ranked readiness degrader, with 81 units on back order.

To develop an alternative manufacturing method to reduce production time and alleviate supply issues, Naval Air Warfare Center Aircraft Division's (NAWCAD) Propulsion and Power departments at Naval Air Station Patuxent River, Maryland, partnered with NAWCAD Lakehurst's Support Equipment and Aircraft Launch and Recovery Equipment, Prototype and Manufacturing Department, as well as members of the F/A-18 program office, Fleet Readiness Center East and the GTC Pneumatics Fleet Support Team engineers.

Through the support of Naval Innovative Science and Engineering (NISE) funding, project members developed and demonstrated an additively-manufactured prototype of this part that is ready for qualification testing. Additive manufacturing is the process of manufacturing a product layer by layer from 3D model data. This is NAWCAD's first organic additive-manufactured CSI part produced via Laser-Powder Bed Fusion. This effort will pave the way towards developing a process for organic production of other hard-to-source and critical parts that are suitable for additive manufacturing. It has significantly increased workforce expertise with reverse engineering and design, and developed a test plan for qualification and subsequent engineering changes. Next steps are to obtain follow-on funding for fleet qualification testing.

From the Naval Air Warfare Center Aircraft Division public affairs.

U.S. Navy photo by MC2 Jackson Adkin

Aviation Machinist's Mate Airman Joseph Davis assigned to the world's largest aircraft carrier USS Gerald R. Ford's (CVN 78) aircraft intermediate maintenance department (AIMD), prepares an F/A-18 Super Hornet engine to be transported into Gerald R. Ford's engine bay, June 14, 2023.

Carl Vinson Carrier Strike Group Returns from Western Pacific Deployment

U.S. Navy photo by Petty Officer 3rd Class Marissa Johnson

Sailors man the rails aboard the Nimitz-class aircraft carrier USS Carl Vinson (CVN 70) during a return to homeport at Naval Air Station North Island, California,, Feb. 23, following a four-month deployment to the western Pacific.

SAN DIEGO, Calif.—Nimitz-class aircraft carrier USS Carl Vinson (CVN 70), flagship of Carrier Strike Group (CSG) 1, returned Feb. 23 to its homeport of Naval Air Station North Island, California, following a four-month deployment to the Western Pacific.

Carl Vinson is joined by two other CSG-1 ships, the Ticonderoga-class guided-missile cruiser USS Princeton (CG 59) and Arleigh Burke-class guided-missile destroyer USS Sterett (DDG 104), which returned to homeport at Naval Base San Diego.

"This Carrier Strike Group and our sailors' deployment accomplishments demonstrate our unwavering contribution to the Navy's global engagement strategy," said Rear Adm. Carlos Sardiello, CSG-1 commander. "During the past four months, we routinely flew and sailed anywhere international law allows to assure Americans, allies and partners of our commitment to bolstering regional security and stability in the Indo-Pacific. With the unwavering support of our families and friends, we were proud to sail and fly forward as a symbol and the promise of America's advantage at sea."

The strike group departed Oct. 12, 2023, for the scheduled deployment from San Diego to sail and maneuver across the U.S. 3rd and 7th Fleet areas of operations. While in 7th Fleet, CSG-1 participated in and supported numerous bilateral and multinational maritime exercises in support of a free and open Indo-Pacific.

The strike group conducted routine port visits to the Republic of Korea, Singapore, Philippines and Hawaii. Individual ships in CSG-1 visited Australia, Japan, Guam, Saipan and Palau.

"These port visits demonstrated U.S. commitment to the Indo-Pacific region and further enhanced relationships with the leaders and local populations," Sardiello said.

In total, the strike group supported U.S. relations with eight allied and partner nations through two Multi-Large Deck Events, Annual Exercise 2023, several bilateral, tri-lateral and multi-lateral maritime exercises in the Philippine Sea and South China Sea. CSG-1 worked alongside Australia, Canada, Indonesia, Japan, Malaysia, Philippines, Republic of Korea and Singapore to reaffirm their commitment to regional stability and security in the Indo-Pacific.

Furthermore, CSG-1 integrated and operated seamlessly with the U.S. Joint Force conducting maritime exercises with Naval Special Warfare operators, unmanned surface vessels, Marine Corps, Army, Air Force and two multi-carrier operations with the Theodore Roosevelt and Ronald Reagan CSGs.

In 133 days underway, the ship's crew conducted 10 underway replenishments, logged more than 13,000 flight hours and over 6,000 sorties, sailed more than 36,000 nautical miles, and safely received over 12 million gallons of fuel with zero mishaps. The Vinson crew conducted 9,540 launch and recovery evolutions, 7,835 aircraft moves, 651 aircraft elevator moves, issued nearly 12 million gallons of fuel to aircraft, and transferred nearly 5,000 pallets of cargo and mail.

"I couldn't be more proud of our sailors. They executed with precision and discipline while strengthening our relationships with allies and partners. They were superb naval ambassadors in foreign ports," said Capt. Matthew Thomas, Carl Vinson's commanding officer. "These highly trained sailors showed they are reliable, resilient and ready to support and defend the American way of life every day."

Notable key leader engagements and visits aboard Carl Vinson included Republic of Korea Minister of Defense, defense chiefs from Indonesia and Malaysia, Commander of Japan Maritime Self-Defense Force, U.S. Ambassadors to Singapore and Indonesia, senior officers from the Armed Forces of the Philippines, U.S. Chief of Naval Operations and Master Chief Petty Officer of the Navy, among others.

The Carl Vinson strike group deployed with flagship USS Carl Vinson and embarked CSG-1 staff, Carrier Air Wing (CVW) 2, Destroyer Squadron (DESRON) 1 staff and the Ticonderoga class guided-missile cruiser USS Princeton (CG 59). DESRON-1 ships included Arleigh Burke-class guided-missile destroyers USS Hopper (DDG 70), USS Kidd (DDG 100), USS Sterett (DDG 104), and USS William P. Lawrence (DDG 110).

The squadrons of CVW-2 embarked aboard Carl Vinson included the F-35C Lightning II squadron, "Warhawks" of Strike Fighter Squadron (VFA) 97; the F/A-18 E/F Super Hornet squadrons, "Bounty Hunters" of VFA-2, "Stingers" of VFA-113, "Golden Dragons" of VFA-192; the "Gauntlets" of Electronic Attack Squadron (VAQ) 136, the "Black Eagles" of Early Warning Squadron (VAW) 113, the "Blue Hawks" of Helicopter Maritime Strike Squadron (HSM) 78, the "Black Knights" of Helicopter Sea Combat Squadron (HSC) 4 and the "Titans" of Fleet Logistics Multi-mission Squadron (VRM) 30.

Vinson's embarked air wing, deployed for the first time with the Navy's newest Block III Super Hornets adding fourth generation plus capability to the largest joint strike fighter air wing in the Navy.

"As the U.S. Navy's most advanced air wing, comprised of 4th and 5th generation strike fighters, advanced electronic attack, technologically-leading command and control, and versatile rotary wing capability, we deliver unprecedented lethality and survivability to CSG-1 ensuring that the strike force can operate and win in contested battlespace both now and well into the future," said Capt. Timothy Myers, CVW-2 commander.

The Carl Vinson CSG is a multiplatform team of ships and aircraft, capable of carrying out a wide variety of missions around the globe from combat missions to humanitarian assistance and disaster relief response.

Written by Seaman Nathan Jordan, USS Carl Vinson public affairs.

U.S. Navy photo by Chief Petty Officer Patrick Gordon

Sailors from the Nimitz-class aircraft carrier USS Carl Vinson (CVN 70) depart the ship after returning to homeport at Naval Air Station North Island, California, Feb. 23.

Gold Star Awarded for Radar ATC Trainer

PATUXENT RIVER, Md.—Identify an issue and work to resolve it. That kind of work ethic exemplifies one of the most recent Navy and Marine Corps Achievement Medal winners, Lt. Cmdr. Sam Hughes, who worked with TechSolutions, at the Office of Naval Research (ONR) Global, to create a new, more efficient way to train radar operators.

Hughes came up with the idea to use a simulation program for training radar operators while working as the Air Traffic Control (ATC) Integrated Product Team (IPT) lead at the Naval Air Warfare Center Training Systems Division (NAWCTSD).

When training new ATC operators, Hughes said he needed two instructors for every trainee, and the training could only take place when the radar scopes were not being used to control aircraft. In addition to manpower and equipment limitations, another issue was the lack of standardization in training methodologies.

"So, we have PQS—performance qualification standards—and they have line items that you have to master before you can get qualified on any position," Hughes said. "Even though the line item might say, and this is just an example, radar vectoring—one controller might teach it one way while another controller teaches it differently."

The new radar simulator trains up to 14 people at one time with a standardized training method.

Hughes originally suggested the idea of a radar simulator to the ATC Trainer Management Team, which was updating the training program at the Naval Air Technical Training Center (NATTC) at Naval Air Station, Pensacola, Florida. They liked the idea but did not have the resources. So, a colleague, then-Lt. Joe Mercado, encouraged him to contact TechSolutions.

The training module, called Dynamic Air Traffic Control Refresher Training System (DARTS), is now being delivered to 35 Navy and Marine Corps sites.

Jason Payne, director, TechSolutions, said the dedicated radar operator training system took less than 12 months to develop. Once they had a prototype, it was transitioned to a Program of Record through the Naval Aviation Training Systems and Ranges Program Office General Training.

"We knew this was a warfighting need that new technology could solve, and something we could help facilitate. So, we asked the Naval R&D community for ideas on how it could be done, and we made an award to the NAWCTSD team to perform the development," Payne said. "The NAWCTSD team delivered a solution that allows a longer period of time for uninterrupted training with a realistic simulator that delivers information more effectively, and now new radar operators will be better equipped for a position of critical need in the Navy and Marine Corps."

Payne added that DARTS is a great example of what can be achieved through the ideas submitted by Sailors and Marines.

"They are in a unique position to tell us what they need to carry out the mis-

U.S. Navy photo

Jason Payne, Office of Naval Research Director of Global Tech Solutions, presents the Navy and Marine Corps Achievement Medal to Lt. Cmdr. Samuel Hughes, for superior performance of his duties in supporting the Air Traffic Control training simulation technology development.

sion the Department of the Navy has asked them to do. They have the knowledge of what would make it better, easier and more effective, and we can help them with the technology to do that," Payne said.

While Hughes' name is written on the certificate from the Department of the Navy, he stressed it was a team effort that helped push the new radar operations training forward. Mercado helped him with the forms and contact information for TechSolutions. He also gave credit to Stephen Lane, NAWCTSD assistant project manager and ATC subject matter expert, who stayed in close contact with ONR Global TechSolutions throughout the process.

"The entire IPT team was pivotal. Cathy Bosarge was the NAWCTSD systems engineer. She worked well with Courtney McNamara, the Advanced Gaming Interactive Learning Environment (AGILE) team lead. AGILE worked hand and hand with the NAW TSD ATC team and the fleet to ensure that what they delivered was exactly what the fleet needed," Hughes said.

"This is 100 percent not me. It was a team effort and as soon as we get it out to the fleet and it works, that'll be the greatest award I could receive."

Hughes recently received his Gold Star, awarded by the Secretary of the Navy, for "professional achievement in the superior performance of his duties while serving in supporting the Air Traffic Control (ATC) training simulation technology development with the Office of Naval Research Global TechSolutions."

Written by Rebecca Ward with the Office of Naval Research.

Helmet-Mounted Components for F/A-18, EA-18G Upgrades Increase Safety, Readiness

PATUXENT RIVER, Md.—The Naval Aircrew Systems Program Office is leading the design and modification of the F/A-18 Hornet and EA-18G Growler pilot helmet-mounted components of the Improved Joint Helmet-Mounted Cuing System (IJHMCS).

The Navy awarded a $16.8 million contract July 28 to Collins Elbit Vision Systems for the design and development of the IJHMCS, making the system lighter in weight with a better center of gravity to reduce potential for pilot back and neck injuries. The program office plans to field the IJHMCS in 2025.

U.S. Navy photo

"This upgrade will significantly reduce head and neck health issues for our aircrews that are associated with the legacy JHMCS system, while providing improved display capabilities and reliability for a critical warfighting system," said Capt. Carey Castelein, program manager.

The IJHMCS team is focusing on strategies that allow for easier updates, make obsolescence issues easier to address and reduce the need for a total system upgrade in the future. The team will also oversee the design and modification of the helmet-mounted components of the legacy JHMCS and JHMCS NVCD in a technology refresh that includes a single high-definition day and night color display.

"The day and night capability associated with IJHMCS will not only provide our aircrews with a lightweight, digital solution, but will also provide increased situational awareness throughout missions and improved reliability, as the aviators will not be required to remove and replace system components in flight," said Brad Schieferdecker, program office vision systems team lead.

The IJHMCS program will leverage efforts from the Air Force Next Generation Fixed Wing (NGFW) helmet program by optimizing the new lightweight center of gravity display unit mounted on the NGFW helmet shell.

From the Naval Aircrew Systems Program Office.

U.S. Navy photo by MC3 Maxwell Orlosky

Aviation Boatswain's Mate (Equipment) 2nd Class Hunter Athey, assigned to the air department of the world's largest aircraft carrier USS Gerald R. Ford (CVN 78), sets tension on an E-2D Hawkeye, attached to the "Bear Aces" of Airborne Command and Control Squadron (VAW) 124, on the flight deck. SPB will be rolled out to all type/model/series aircraft.

SPB Dashboard Raises Stakeholders' Awareness of Long-Term Sustainment Health

PATUXENT RIVER, Md.—Program office decision makers, engineers, logisticians and other stakeholders now have an improved and comprehensive information technology solution that supports quicker and deeper analyses of weapon systems' long-term sustainment health and interdependent processes. Called the Sustainment Program Baseline (SPB) Dashboard, it tracks a weapon system's sustainment phase performance against an established baseline.

First developed in 2021 and updated in the fall of 2023 to better illustrate causation-effect relationships and background functionality, the SPB Monitoring Dashboard pulls data from multiple sources from across Naval Aviation and aggregates it to give a comprehensive picture of a weapon system's sustainment health, according to Sustainment Performance & Optimization Team Director Michael Kaczmarek.

"It currently displays 74 metrics in an automated hierarchical format, showing the relationships of material and sustainment metrics to operational requirements," he said. "Eight programs can now look at this real-time data with just a glance."

The team is working to incorporate more than 120 additional holistic metrics.

The dashboard supports SPB, a planning, management and governance approach with quantitative measures of success used by program managers, resource sponsors and acquisition executives to govern and manage the sustainment strategy for the life of the program. It was developed to answer the call from the 2018 Fiscal Year National Defense Authorization Act and senior Navy leadership for a process to monitor the health of weapon systems throughout their acquisition and sustainment phases, to include maintenance. The NAVAIR Sustainment Group partnered with the Deputy Assistant Secretary of the Navy (DASN) for Sustainment and Commander, Naval Air Forces (CNAF) to develop the solution.

The SPB Dashboard also significantly reduces the time program offices spend collecting and processing data, Sustainment Performance & Optimization Team Deputy Director Laurie Zuniga said.

"Before this version, program managers gathered data and conducted analysis either by hand or via multiple online sources," she said. "When defining its requirements, program decision makers wanted to make it easier to determine if a program was meeting its objective thresholds. They also needed the ability to drill down and identify root causes so that mitigation strategies could be implemented."

"Now that the process is fully automated and we can see how scheduled maintenance and unscheduled maintenance impacts a weapon system's fully mission capable rates and availability status," said Independent Logistics Assessment Lead and team member Jimmy Brown. "That information is available down to the level of each aircraft. It also aligns to a weapon system's Life Cycle Sustainment Plan (LCSP)."

An LCSP is framework that enables users to think systematically and critically through the set of planning factors that must be integrated and communicated across the enterprise to achieve required sustainment outcomes.

"This is the first time this level of synthesis of information is available," he said.

Brown said the team's work is not finished.

"Use of the SPB Dashboard will be expanded to include all Naval Aviation aircraft," he said. "After additional updates to this version are completed, the dashboard will depict driver-tree views that show causation-effect relationships for all naval aircraft."

"SPB 3.0 will pull in data from commercial sources, unmanned aircraft systems and other commodities," he said, "providing users with greater visibility into the interdependencies of processes and enhance users' data-informed decision-making."

"This capability transforms how we approach prioritization of resources in naval aviation," Kaczmarek said. "It's an important milestone in the maturation of the SPB."

From the Naval Air Systems Command (NAVAIR) Sustainment Group.

Airborne Command & Control Squadron (VAW) 120 marks the end of its training role for the C-2A Greyhound aircraft's carrier onboard delivery mission with a final flight over the Wright Brothers First Flight memorial at Kill Devil Hills, N.C.

U.S. Navy photo by Aircrew Survival Equipmentman 2nd Class Richard Warren

VAW-120 Participates in Final Flight of C-2A Greyhound; Signifies End of Squadron's Training Mission for Carrier Onboard Delivery

NORFOLK, Va.—To mark the official end of the Airborne Command & Control Squadron (VAW) 120 Fleet Replacement Squadron (FRS) training role for the carrier onboard delivery (COD) mission, the squadron's last C-2 instructor pilot, VAW-120 executive officer and aircrew flew the C-2A Greyhound aircraft during a ceremonial flight over the Outer Banks and Cape Hatteras operating area, Oct. 30.

Since September 1994, VAW-120 has served as the single FRS squadron to train all E-2C/D Hawkeye and C-2A aircrew. The last VAW-120 Greyhound flight provided an opportunity to recognize all of the previous aircrew who were trained at VAW-120 to operate the Greyhound.

Lt. Spencer Tack, who commanded the flight, flew the last VAW-120 Greyhound at the FRS. Tack discussed the opportunity to be part of the platform's storied history.

"It is surreal … we all knew it was not going to be around forever," Tack said, who completed the training of the final two C-2A aircrew in late September 2023. "I didn't think I would get a spot at the FRS initially, but looking back now, being one among the last is a huge honor."

VAW-120's last two C-2 instructor pilots, Tack and Lt. Patrick Sopko, have shared a similar path to arrive at this historical juncture together. Both received their commissions in 2014, Tack in March and Sopko in May. After initial flight school, they reported to VAW-120 and qualified together in 2017. Soon after their FRS training, Sopko left for Fleet Logistics Squadron (VRC) 30 on the west coast and Tack to VRC-40 on the east coast. Once again, in April 2021, both aviators returned to VAW-120 to train the remaining aircrew who will operate the C-2A until VRC-40 is decommissioned in 2026.

"I don't think it really has hit me yet; I also attended the decommissioning ceremony at VRC-30," Sopko said. "It is still an honor to represent the last instructors who have trained aircrew to operate the C-2."

Over the last several years while assigned to VAW-120, Tack and Sopko trained up to 15 aircrew. While both checked aboard as instructors, they will check out together and report to VRC-40 where they will fly alongside the very same pilots they helped train over the past few years.

During the historical flight of VAW-120's last C-2A, an E-2C Hawkeye, E-2D Advanced Hawkeye and a second C-2A from VRC-40 participated in the ceremonial flight to recognize past aviation accomplishments both in civilian and military history. The flight plan included a flyover above the Wright Brothers First Flight memorial.

"A lot of history in aviation, proud to incorporate our flight above the Wright Brothers National Memorial to signify their contributions to aviation and honor that of all aircrew who have trained at VAW-120 to fly the C-2A," said Lt. Joshua Reyes, a VAW-120 E-2 instructor pilot who conducted the flight planning for the historical flight. While that first flight lasted 12 seconds and covered a distance of 120 feet, it changed the aviation world.

Fleet Logistics Multi-Mission Wing and the CMV-22B Osprey aircraft will be the replacement for the C-2A Greyhound for the COD mission. It provides the Navy with increases in capability and operational flexibility over the C-2A.

Written by Jennifer Cragg, a public affairs specialist for Commander, Naval Air Forces Atlantic.

TOMORROW LOOKS FOR NAVAL HELICOP

By Lt. Michelle Hernandez (U.S. Coast Guard) and Capt. Chris Hulser (U.S. Coast Guard)

The Navy took a first step to enhance rotary-wing aviation capabilities with an innovative approach that will benefit an age-old partnership. Eight Student Naval Aviators (SNA) including five Navy and three Coast Guard students began training under a new joint-Service, public-private partnership program that promises faster time-to-train, greater helicopter simulator availability and in-aircraft training hours, and a better rotary-wing aviator for the joint-maritime services' talent supply lines.

These eight students are the first cohort of 48 volunteers (33 Navy and 15 Coast Guard) who have volunteered to participate in a rotary-only training pipeline that could replace traditional primary air training for aspiring helicopter pilots that opt into the program. If the pilot program is successful, the Navy hopes to permanently establish the rotary-only pipeline for helicopter students by fiscal year 2026. So far, Chief of Naval Air Training (CNATRA) reports that this new program can reduce time to train in the overall timeline for helicopter students by 13 weeks.

The Naval Air Training Command awarded a contract to Helicopter Institute, Inc. of Fort Worth, Texas, in the fall to evaluate contractor-based solutions to helicopter training.

"It is great to see our efforts to break out of the status quo—and the way we have done business—paying off," former Commander, Coast Guard Force Readiness Command Rear Admiral Joe Raymond said. Raymond sponsored Coast Guard participation in the effort and helped shape the program.

Primary training for helicopter pilots has not fundamentally changed in nearly half a century. Prior to this initiative, prospective rotary-wing Naval Aviators (Navy, Coast Guard, and Marine Corps) reported to training in Pensacola, Florida, and flew fixed wing followed by rotary-wing. This pipeline's time requirement could take upwards of three years to complete. This expanding time requirement was a primary driver for the CNATRA to carefully study the Air Force's and Army's rotary-wing-only training pipeline, which graduates a pilot in just over one year.

A Navy TH-57C Sea Ranger and a Navy TH-73A Thrasher, assigned to Training Air Wing Five (TAW-5) and flown by instructors from Helicopter Training Squadron 8 (HT-8), Helicopter Training Squadron 18 (HT-18), and Helicopter Training Squadron 28 (HT-28), fly over Pensacola, Florida, on Tuesday, Sept. 12, 2023.

U.S. Navy photo by Antonio More

DIFFERENT TER TRAINING

Aviation Training in the 1940s

In the 1940s, the path to becoming a naval aviator was characterized by rigorous classroom instruction in areas of meteorology, aerodynamics, engineering, aviation safety, aviation physiology and more. In the following decades, the training system was adapted to include rotary-wing training, though it resembled a "bolt-on" addition at the end of fixed-wing training. The Army was the first to pioneer a rotary-wing only pipeline in the mid-1950s; the Air Force reinstituted its helicopter-only training in 2021 as part of its Helicopter Training Next initiative. Previously, the Air Force, like the Navy, required fixed-wing undergraduate pilot training before moving on to helicopters.

Regardless of the service branch or stage of training, previously most instruction occurred in the aircraft itself. As recently as the 1990s, a task as simple as learning to tune the radio was done in the aircraft, at altitude, at high expense and relatively high-risk. Training systems matured to incorporate simulators, some as basic as a tabletop trainer to manipulate navigation and radio systems, to improve quality and time-to-train. Just like the advent of sloped-deck aircraft carriers in the 1960s, technology made aviation operations and training safer. By today's standards, the majority of aviation training pipelines utilize simulators and advanced technology such as virtual and augmented reality.

Training after World War II took just under one year and was divided into three-phases of training: primary, basic and advanced. Aspiring aviators accumulated 65 flying hours during primary instruction and 140 hours between basic and advanced training. This equated to roughly 200 hours of in-aircraft training, first in fixed-wing aircraft, and then later in rotary-wing aircraft. Once helicopter training arrived on scene, the obvious solution was to simply add rotary-wing training onto the end of a proven flight training curriculum. Hence, all naval aviators were initially trained as fixed-wing pilots. This model changed little from 1940 to 2023.

The success of the Naval Aviation training system has endured for decades and was crucially tested in the crucibles of WWII, Korea, Vietnam and over the skies of the Middle East and Afghanistan, and reaffirms the principle that quality of training remains a linchpin of military readiness and success. Understanding the history of this training system, its challenges, successes and failures is paramount to upholding its legacy and ensuring its continued effectiveness. However, another linchpin of military success is to never rest on laurels—innovation and progress must be embraced. With the advent of modern technology, and the increased time-to-train, Naval Aviation rotary-wing training was thoroughly examined for innovative opportunities.

A New Approach to Training

With a similar structure to the Air Force's model, the Navy and Coast Guard are participating in the most impactful change to rotary-wing aviation training in half a century. The Air Force beta-tested a new program labeled by CNATRA as Contract Operated Primary Training—Rotary (COPT-R) throughout 2022. This program questioned the need for a rotary-wing flight student to have any appreciable fixed-wing airplane training. It surmised the time spent in a single-engine airplane would be far better served with training focused solely in helicopters and associated rotary-wing training devices. Further, the system capitalized on a blend of contract and military training to provide an optimal mix of education and training for new pilots with tangible gains in time and cost-to-train.

Beginning in the 1990s, as the aviation landscape transformed, decision-makers noted the effectiveness of rotary-wing only training, utilized by the Army for decades with great success. This approach, which aimed to produce skilled helicopter pilots in approximately 12 months, garnered increasing attention as the need for more agile, cost-efficient training solutions became evident. The Naval Aviation helicopter training has now taken a leap into this modern paradigm and the results are promising.

To date, the Air Force's rotary-wing-only program has produced 24 winged aviators in the 12-month program. Initial feedback from squadrons receiving the new pilots is that quality was not sacrificed, and the new pilots are equally ready for transition to their fleet aircraft as the legacy students, which often took two to three times as long.

Collaboration to Explore a New Program

Unbeknownst to the Navy, a team from the Coast Guard's Aviation Training Center (ATC) and Coast Guard Liaison Office (CGLO) at Naval Air Station Pensacola conducted on-site evaluations of the new Air Force program in January 2023. Simultaneous studies were underway by the CNATRA team for Navy implementation. The findings were inspiring to both services: this hybrid model, which incorporated elements from the Air Force's training program, could provide the services what they needed. This strategic adaptation served as a crucial step forward in ensuring our maritime aviation forces remain well-prepared and mission-ready in today's dynamic operational environment.

Under this newly developed program, students will complete several discrete phases of training, just like pilots have for decades, but at several locations and some under contract training agreements. While phased training is not new, content of these phases is starkly different. Student Naval Aviators first report to Naval Air Station (NAS) Pensacola for medical screening, indoctrination, and introductory flight training, including academic lessons and approximately 10 hours of "introduction to flight" in a low-performance fixed-wing aircraft. Then, it's on to a contractor owned/contractor operated helicopter flight school called "The Helicopter Institute" in Fort Worth, Texas, to train in the Bell 206 (TH-57 Sea Ranger) helicopter. After completion of this "basic" flight training, in which students amass 50 hours of in-aircraft flight experience, they report to Advanced Helicopter Training at NAS Whiting Field, Florida. The TH-73 Thrasher will soon replace the aging TH-57 Sea Ranger as the advanced air training platform for helicopters at Whiting Field.

'I Have the Controls'…Early…Under this New Training Program

The program focuses on hands-on training right from the start. On day two of the 12-week program, students take the controls. This approach breaks training down into four digestible stages that pave the way to master helicopter flight in 81 ground training hours and 50 flight hours.

During Stage One, students delve into the foundational knowledge necessary for a private pilot helicopter license. Ground classes are a deep dive into aeronautical fundamentals, while flight sessions introduced the students to basic Visual Flight Rules (VFR) maneuvers and pre-solo training, laying the groundwork for future success. The syllabus was designed to have students in the cockpit every other day in order to transfer their knowledge to the controls. This is a stark difference from legacy training syllabi, in which students can be situated in long periods of classroom activities.

U.S. Navy photo by Lt. Michelle Tucker

The Navy's first TH-73A Thrasher, left, arrives at Naval Air Station Whiting Field, Milton, Florida, Aug. 6, 2021, escorted by a TH-57B Sea Ranger.

This first phase of training sets students up for success with small group learning in a 2.6-to-1 student-to-instructor ratio, and hands-on flying right from the start. Even the location is ideal, utilizing three outlying fields nearby Fort Worth Meacham International Airport, Texas. This atmosphere exposes students to one of the busiest Class Bravo and Delta airspaces in the world and a multitude of airports in the Fort Worth/Dallas area that creates a perfect environment for honing radio communication skills, navigation, and the ability to make critical decisions in the face of ever-changing weather conditions.

Stage Two training marks a transition into navigation and aeronautical general knowledge. In the classroom, students toil over charts, become masters of aviation weather and gain a profound understanding of aeronautical regulations. In the air, students practice performance maneuvers, make a first foray into night flying, and embark on thrilling cross-country journeys, broadening horizons and cultivating expertise, which will result in mastering the craft of aviation.

Stage Three training is a pivotal moment. Ground classes are devoted to special operations, handling emergencies, and prepa-

ration for the practical examinations to meet FAA and eventually Navy "check rides" at NAS Whiting Field—South in Milton, Florida, during advanced flight. In the skies, students undertake VFR cross-country flights, coordinate special operations maneuvers in confined areas, and prepare for the end-of-stage practical test, and finally, the "solo." This phase ensures students can navigate any situation with the poise and precision required of a military pilot. As students transition into the final stage, the intrigue of flying by instruments awaits.

Stage Four training reorients focus towards cockpit instrumentation, prioritizing a comprehensive understanding of instrument operations. Ground classes delve deep into the fundamentals of instrument flight, emphasizing instrument interpretation and cross-check procedures to enhance precision and elevate flight capabilities. This stage offers an in-depth education in basic instrument maneuvers, partial panel operations, and precision approach techniques, cultivating proficient aviators with the requisite skills to navigate the skies safely and confidently.

"The Helicopter Institute's" student-friendly curriculum, digestible stages, and diversified learning methodology embrace a hybrid approach to prepare students for advanced helicopter training at NAS Whiting Field and Part 141 Private Pilot Helicopter Course. It ensures students have the required aeronautical knowledge, skills and experience to safely and successfully conduct helicopter flight operations under Day & Night VFR and to meet or exceed the requirements for a helicopter Private Pilot Certificate. In short, when pilots graduate from this phase of flight training, they are ready for military advanced training at NAS Whiting Field. These "new" students will start Advanced Helicopter Training alongside legacy advanced students. However, the students trained under this new system will have 50 hours of in-helicopter flight training, and exposure to helicopter operations from the four stages provided by the COPT-R program.

"It is really reshaping the way we are training our rotary wing pilots with the collateral benefit of reducing pilot training timelines," Rear Adm. Jeffrey Randall, current Commander, Force Readiness Command (USCG) said.

CNATRA's mission is to train, mentor and deliver the highest quality naval aviators who prevail in competition, crisis, and conflict. Headquartered at NAS Corpus Christi, CNATRA comprises five training air wings in Florida, Mississippi and Texas, which are home to 17 training squadrons. In addition, CNATRA oversees the Navy Flight Demonstration Squadron the Blue Angels and the training curriculum for all fleet replacement squadrons.

David Byrd, Editor in Chief of Naval Aviation News, contributed to this article.

Super Stallion Mission Data Team Breaks New Ground in Aviation

By Jason Babcock

By taking a simple solution and applying it to a needed upgrade, the CH-53E Super Stallion heavy lift helicopter is breaking new ground for Naval Aviation.

In December 2023, the H-53 Heavy Lift Helicopters Program Office started installation of a first-ever fully integrated, hard-mounted commercial off-the-shelf tablet functioning as a primary mission display on a naval aircraft. In doing so, the CH-53E Mission Data Extender team provided a replacement for a legacy capability while also enhancing current operational capabilities at a fraction of the development cost and schedule of a new mission display.

"This is a huge step toward open architecture, innovative solutions to mission-data presentation," said Lt. Cmdr. Neil Whitesell, former In-Service Avionics Systems project officer. "We did it at low cost, fast, and we provided a major capability improvement to the warfighter."

Currently, the CH-53E Super Stallion uses two instrument panel-mounted Smart Multi-Function Color Displays (SMFCDs) as primary mission displays. The SMFCD presents hover cueing, own ship position, threat reports, route/waypoint information, moving map and real-time Forward Looking Infrared (FLIR). The SMFCD is currently suffering from reliability and reparability issues that reduce availability on the flight line and hinder readiness. Due to the high cost and lengthy timeline to perform a technical refresh on the existing SMFCDs, the program office required an innovative solution. The Avionics Integrated Project Team (IPT), in conjunction with the Tactical Mobility (TacMo) IPT at Naval Air Warfare Center Weapons Division (NAWCWD), fleet and industry partners developed a cyber-resilient system of systems collectively known as the Mission Data Extender (MDE) to replace the aging SMFCD.

MDE used a novel mix of developmental and non-developmental commercial/government off-the-shelf (C/GOTS) components to provide legacy SMFCD capability, while also enhancing operational capability. The system was comprised of a GOTS avionics bus reader (MOB HUB) developed by the China Lake TacMo IPT, and the COTS Miniature Encrypted Wireless Link (MEWL) and Marine Air-Ground Tablet (MAGTAB) provided

U.S. Marine Corps photo

The CH-53E Mission Data Extender team installed the first-ever fully integrated, hard-mounted commercial off-the-shelf tablet functioning as a primary mission display on a naval aircraft.

A Marine Corps CH-53E Super Stallion crew chief assigned to Marine Medium Tiltrotor Squadron (VMM) 165 (Reinforced), 15th Marine Expeditionary Unit, prepares for flight operations.

U.S. Marine Corps photo by Sgt. Patrick Katz

by Kranze Technology Solutions (KTS). Additionally, MAGTAB required a cockpit instrument panel mount to allow for heads up FLIR presentation in the cockpit. In close partnership with fleet users and an industry partner, Integrated Consultants Incorporated (ICI), the MDE team developed the first-ever permanent primary instrument panel mount for a COTS tablet in the Naval Aviation Enterprise. The resulting Informant Mount provides for continuous tablet charging, quick mount/dismount of the pilots' MAGTABs, and allows for swap-in/swap-out interchangeability with legacy SMFCDs. The Informant Mount provided flexibility for the fleet operators to tailor their preferred mission display according to mission requirements and available hardware, and to utilize their MAGTAB as both an instrument panel mission display and/or a kneeboard. The same physical MAGTAB can now be used for mission planning, assault package briefing, mission execution and section debrief without the need for removable media.

In addition to mounting provisions for the MAGTAB, the MDE system also provided much-needed permanent mounting provisions for carry-on data terminals widely used throughout the CH-53E fleet. As a result, the capability of the CH-53E mission display expanded to include a new Automatic Dependent Surveillance-Broadcast (ADS-B) capability, as well as Mobile User Objective System (MUOS) Data connectivity via carry-on ground radios. As an additional capability enhancement, the MDE was also designed to interface seamlessly with the newly fielded Link16 and ANW2 DI system being incorporated on the CH-53E during MDE development.

Finally, MDE development required the creation of a new software application to provide the legacy hover cueing displays available in the SMFCD. The program office was able to leverage their existing Software Support Activity (SSA), Noetic Inc., to code and deliver a new application to the MAGTAB within a single design sprint. By virtue of hosting this capability on an open system tablet, mission display capability insertion can now occur on the order of months, and at a fraction of the cost of developing new proprietary software code.

"The CH-53E now has an aircraft-powered, WiFi-based mission display capable of seamless interoperability with several carry-on data terminals, and capable of walk-on/walk-off expeditionary mission planning," Whitesell said. In addition, the integration allows for rapid capability insertion through Modular Open Systems Approach (MOSA) concepts, he said.

The MDE was an exemplary example of NAVAIR's capacity for organic innovation and rapid fielding. Altogether, the MDE system managed to bring all legacy SMFCD capability forward, concentrate all digital interoperability data onto a single aircrew interface, and place that interface on the pilot instrument panel as a tablet-based primary mission display. MDE represented a huge leap in capability and readiness, at less than one-third of the cost and schedule to upgrade the legacy SMFCD display.

Jason Babcock is a communications specialist with the H-53 Heavy Lift Helicopters Program Office.

LAKEHURST'S PHS&T LAB

KEEPS MILITARY CARGO MOVING SAFELY, STORED SECURELY

By Adam Hochron

Anyone who has purchased items online or from a store knows damaged or inadequate packaging often results in damaged contents. Proper packaging is often overlooked until there is a situation where the item(s) become damaged. For the Navy, improper packaging can result in loss of readiness as well as loss of capital. That's why the work done by the Packaging, Handling, Storage and Transportation (PHS&T) lab at Naval Air Warfare Center Aircraft Division Lakehurst, New Jersey, is essential to supporting the warfighter.

The PHS&T lab tests barrier packaging materials and re-usable containers used for shipping Navy repairables worldwide, from items as small as a deck of cards to as large as a full-sized aircraft.

Along with ensuring the safety of items during storage and transportation, the lab tests barrier materials that protect items that are susceptible to damage from electromagnetic interference (EMI) as well as static electric release events. In addition, the lab tests barrier materials that provide water and vapor-proof protection to items that are at risk for corrosion. Mitigating corrosion is an integral step in ensuring that the items issued to the fleet are ready for use.

The PHS&T lab has two locations at Lakehurst, building 333 for packaging materials testing and building 678 for container testing.

"Our standards are higher than commercial standards because our storage time and distribution environment is uncompromising," lab manager Karen McDonnell said. "Our storage is not temperature and humidity controlled with a short shelf storage. Therefore, our packaging must be theatre-robust in all weather, and ready-for-issue after five, 10 and even 15 years of storage. Oftentimes, some may view proper packaging as more expensive, but the environment can be harsh and the items they protect are critical to readiness. In the long run, the packaging is negligible compared to losing an asset."

Mechanical engineer Michael Ruff demonstrates a machine that can make bubble paper capable of withstanding the weight of an adult without popping.

U.S. Navy photos by Adam Hochron

Lab Manager Karen McDonnell demonstrates Quick RT, a packaging system that creates a barrier bag, which can protect items from shock and vibration impulses during shipping.

"It all comes down to preservation and packaging. It all depends on the need of the item," mechanical engineer Michael Ruff added.

The lab is currently testing Odor Barrier Bags that will hopefully provide the Navy with an additional manufacturer for food-contaminated plastic waste bags used on submarines. Waste management can be critical for the ship's success as the crew can spend long stretches underwater without having a place to offload the garbage. The plastic garbage bags not only contain liquids but also prevents odors from spreading throughout the ship.

"Most people say, 'Oh, it's just a trash bag.' But it is so essential that they can't go on deployment without it," Ruff said. "Most people look at it like it is regular plastic. But you can see how many different layers are in there."

The lab also helped address a storage issue with bubble wrap used on ships where space is at a premium. The solution they found is a machine that can take what looks like a roll of regular plastic and inflate it into a very protective bubble wrap that can withstand an adult's weight without popping.

"You go from this huge roll hanging from the ceiling to a roll that hooks onto this little machine, and it gives you as much as you need," McDonnell said.

One difference between the more common bubble-wrap and what they tested in the lab, according to McDonnell, is that the commercially available version inflates the bubbles individually while the version they tested inflates whole rows to increase its strength and stability.

The lab also worked on another space saving system working with Naval Sea Systems Command, Naval Air Systems Command and the Air Force to develop a Joint Modular Intermodal Container (JMIC). Unlike other storage containers that stay in one configuration taking up extra space on a ship, the JMIC collapses on itself and can be stacked for easier storage. The partners in the program all fall under the umbrella of PHS&T, which serves all of the Department of Defense.

Working on a much larger scale, the lab assisted in the preservation of an AH-1Z, a UH-1Y and a V-22 Osprey using a combination of desiccant, water vapor-proof barrier material and shrink-wrap. Ruff described the size of the bag used to enclose the aircraft as "enormous," noting that the wrapping was more cost-effective than transporting the aircraft to another location for storage.

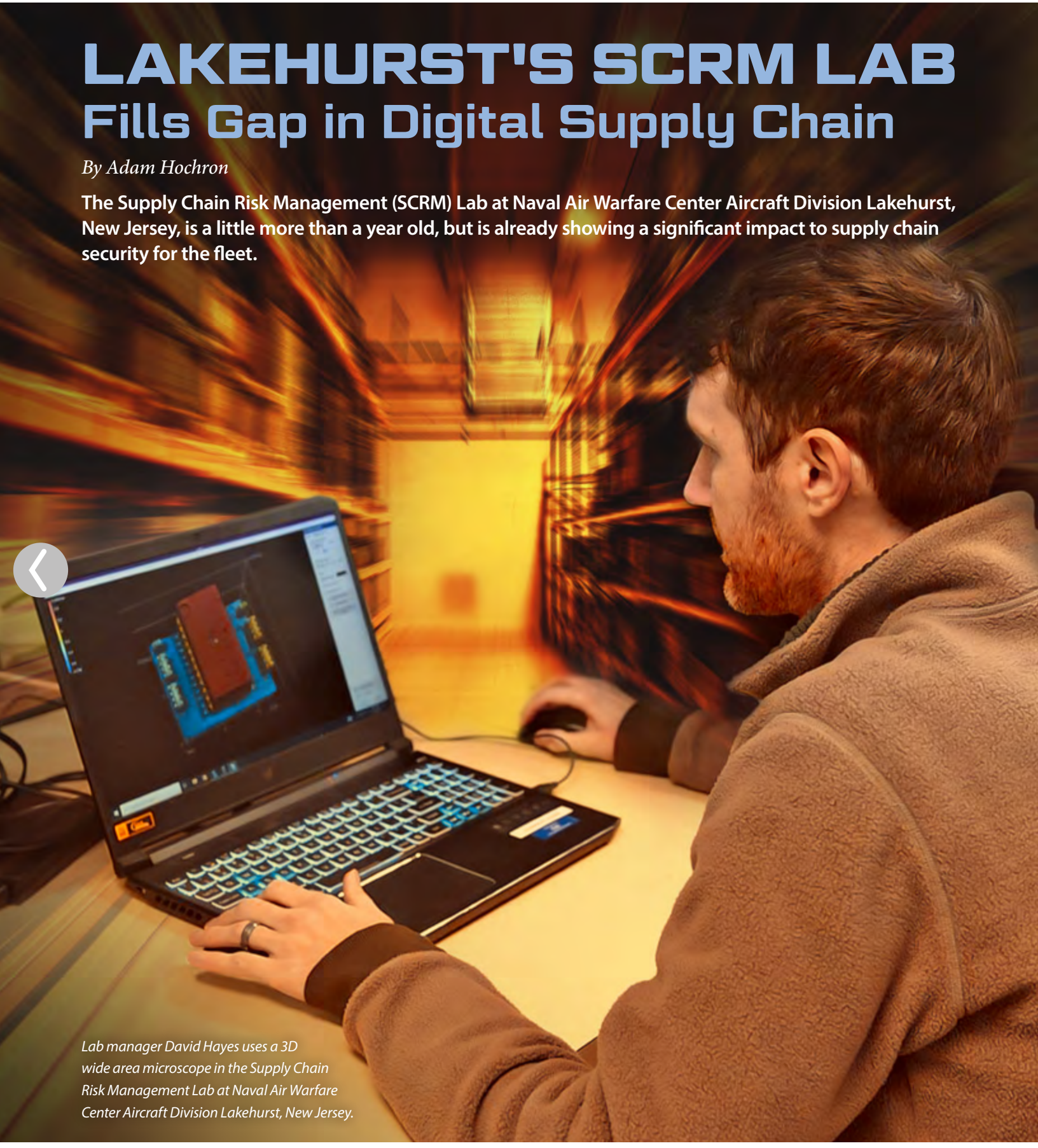
In addition to working with military partners, the lab also provides a unique capability with industry partners. When an original equipment manufacturer is developing a product that could be used for packaging, storing or transportation, the lab provides testing for the item and helps with development before making it available to the Department of Defense.

Adam Hochron is a communications specialist with Naval Air Warfare Center Aircraft Division Lakehurst, New Jersey.

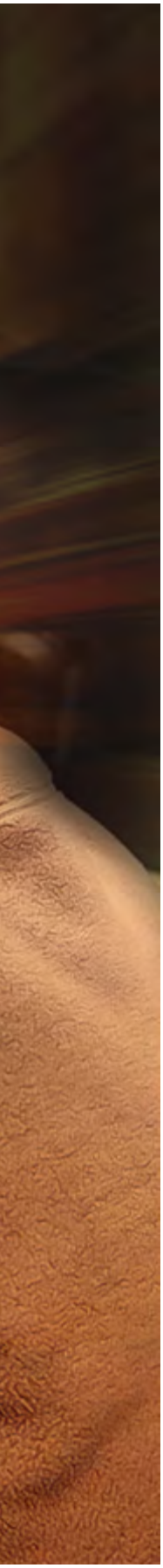
LAKEHURST'S SCRM LAB
Fills Gap in Digital Supply Chain

By Adam Hochron

The Supply Chain Risk Management (SCRM) Lab at Naval Air Warfare Center Aircraft Division Lakehurst, New Jersey, is a little more than a year old, but is already showing a significant impact to supply chain security for the fleet.



Lab manager David Hayes uses a 3D wide area microscope in the Supply Chain Risk Management Lab at Naval Air Warfare Center Aircraft Division Lakehurst, New Jersey.



U.S. Navy photo illustration by Fred Flerlage; imagery by U.S. Navy photo

One of the SCRM lab's critical assets is its members' flexibility to respond to evolving threats. For example, when a system is undergoing an Engineering Change Proposal, and engineers look at whether new equipment meets specifications, the SCRM lab evaluates where the equipment hardware and software is coming from and identifies potential vulnerabilities or threats in the supply chain.

Jack Menzies, the NAWCAD Lakehurst Cyber Team Lead for Data Analytics, said that working in cyber security for more than a decade has seen significant changes, with the SCRM lab just the latest example of providing new tools to support the warfighter. The ability to test for counterfeit or manipulated components is invaluable when adversaries are constantly looking for advantages in the virtual realm.

"Essentially, our goal is to fill a gap with respect to providing supply chain risk cognizance to our systems," said lab manager David Hayes. "Before this lab was stood up, our systems didn't have a standardized way of performing due diligence on their equipment from a supply chain perspective, things like who's providing subcomponents, who's writing firmware, what software packages are being utilized, and things like that."

Hayes said the idea for the lab started to crystalize in 2019 as a Naval Innovative Science and Engineering (NISE) research project to look at what supply chain gaps existed within the Naval Air Systems Command (NAVAIR) enterprise and how that compared to others in the Department of Defense and the federal government as a whole.

"We started more with a focus on hardware and software. Now we're moving into the firmware environment," Hayes said. "We want to make sure that we're staying up to date with what everyone else is doing, making sure we're maintaining open lines of communication with other experts in the field, that we are up to date with the latest guidance, and that we are providing an effective and efficient service to our systems."

The way the lab achieves all these goals simultaneously, according to Hayes, is by constantly adapting to and adopting new technologies and best practices to ensure customers get the best possible product.

Hayes said the SCRM team has built close relationships with other labs at Lakehurst, including labs from the Prototype, Manufacturing & Test (PMT), Support Equipment (SE) and Mission Operations & Integration (MO&I) Departments. While the labs use much of the same equipment and machinery, Hayes said the application varies based on the team's needs.

The new lab has also allowed Lakehurst to bring on new personnel, including computer engineer Angelo Cardinale, who started as an intern before joining the lab in March 2023. Cardinale said his current main task is disassembling any hardware equipment they receive to check for questionable parts and pieces, and to develop hardware bills of material using microscopes, circuit card readers and other pieces of specialized equipment. While the lab and Cardinale are still relatively new to Lakehurst, he said he knows the work they do is essential.

"Other nations, other governments, everyone's trying to learn what we're doing, what the government is doing, what the military is doing. And if they have a listening device on some piece of equipment that might be going out onto a ship, then they're going to be able to see what we're doing on those ships and understand some of our plans or tactics or just know how the equipment works," Cardinale said. "And by knowing how it works, they can end up shutting it down and causing real damage to the forces out there."

Along with looking at the physical equipment, personnel like supply chain risk analyst Kristina Harrington do a deeper dive into the vendors of the Navy's systems. By doing a full review of the companies, Harrington said the lab has a better sense of whether the chain is safe and secure before sending the parts to the Sailors. As a newcomer to Lakehurst, Harrington said she enjoys being a small part of a much larger effort.

"It's definitely an honor to be able to do something that's helping the fleet and support them to make sure what they're doing can be safe and secure and not have to worry about that on top of other things," Harrington said.

Hayes said one of the lab's main focuses now is educating people involved in supply chain risk management on the importance of following protocols to check for risks during a system's lifecycle.

Having come to Lakehurst as a database developer, Hayes said he is excited to be part of a new endeavor with the SCRM lab.

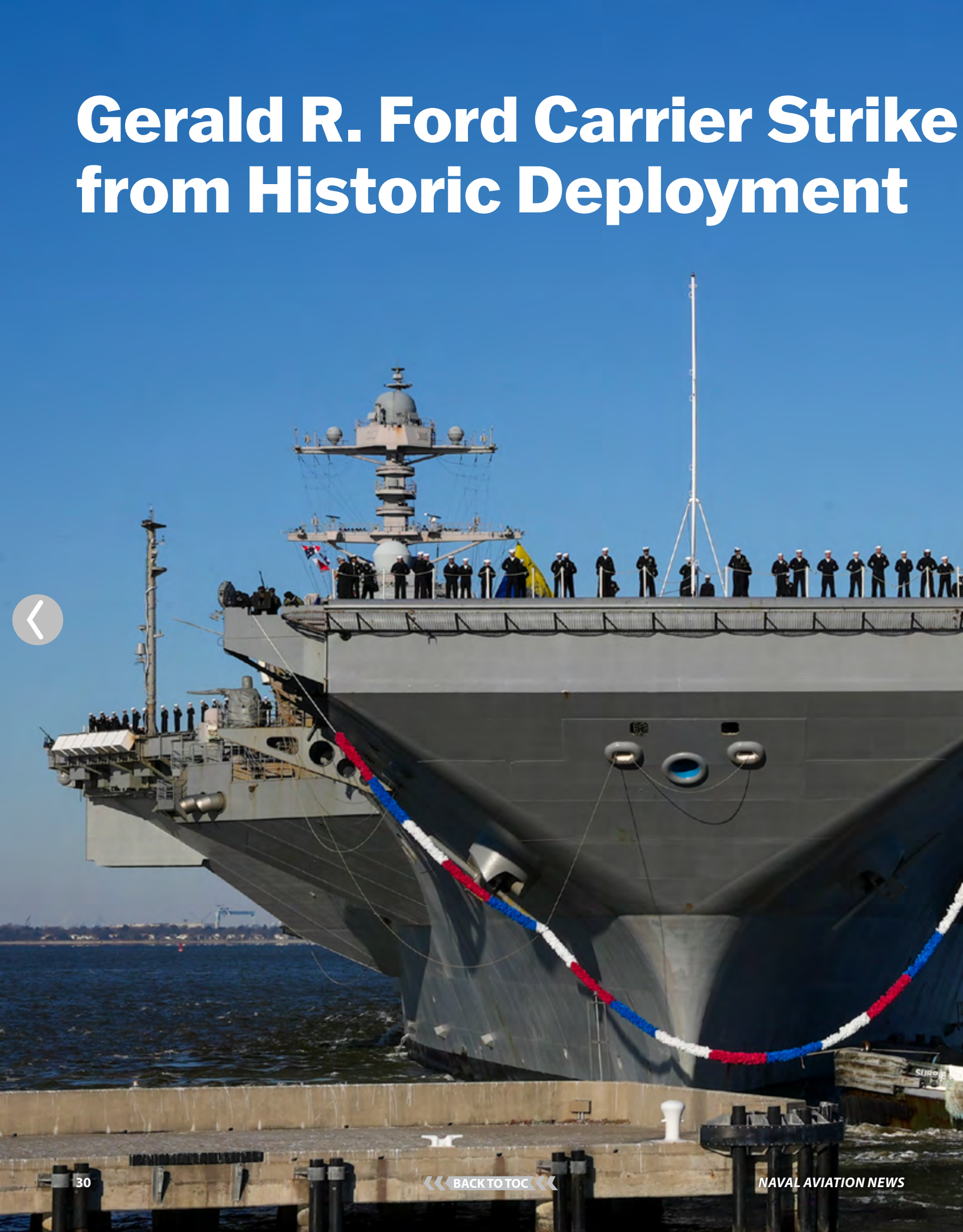
"I enjoy having been able to get in on the ground floor of a new capability. And I think because there is still room for growth, I think there's opportunity for all of us to express our ideas and see those ideas meaningfully implemented," Hayes said.

Part of that effort includes onboarding new tools and adding automation, which can help to find threats faster. Menzies said it is also important for people to know about the lab's abilities and how it provides support.

"The future for all of these programs is to have this information, feed it into their cybersecurity profile, and give them a better idea of their risks to the system and how to best use their money to address those risks," Menzies said.

Adam Hochron is a communications specialist with Naval Air Warfare Center Aircraft Division Lakehurst, New Jersey.

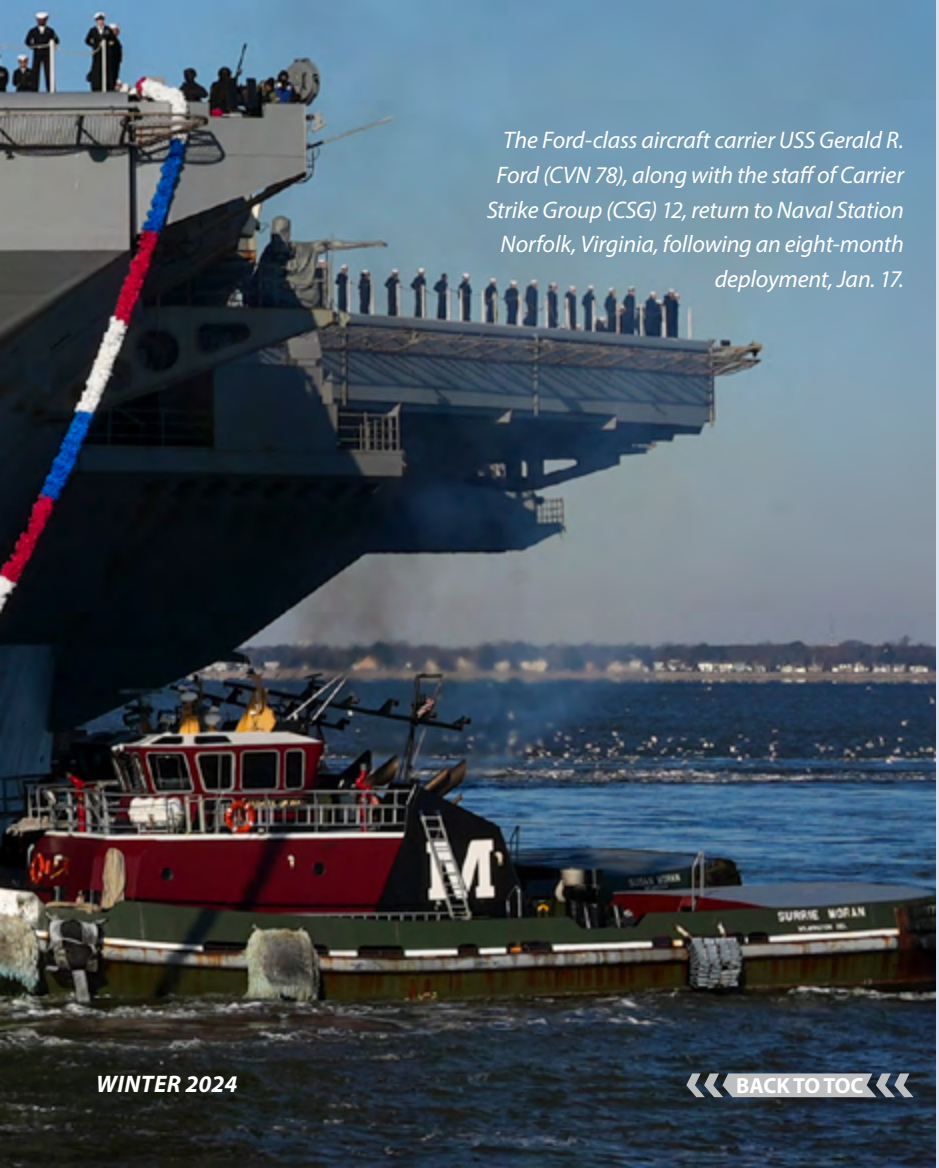
Gerald R. Ford Carrier Strike from Historic Deployment



Group Returns

By Petty Officer 1st Class Brian Glunt

USS Gerald R. Ford (CVN 78) returned Jan. 17 to its homeport of Naval Station Norfolk, Virginia, following an eight-month deployment.



The Ford-class aircraft carrier USS Gerald R. Ford (CVN 78), along with the staff of Carrier Strike Group (CSG) 12, return to Naval Station Norfolk, Virginia, following an eight-month deployment, Jan. 17.

U.S. Navy photo by MC2 Manvir Gil

Gerald R. Ford is the flagship of Carrier Strike Group (CSG) 12 and deployed to the U.S. Naval Forces Europe area of operations.

"I am incredibly proud of every member of the strike group, especially the triads who led their teams of exceptionally talented sailors with professionalism and perseverance," said Rear Adm. Erik Eslich, commander of CSG-12. "Due to our collective efforts, we excelled during a very challenging deployment, demonstrating the capabilities of a U.S. Navy carrier strike group, assuring our partners and allies, and deterring our adversaries with our operations in the U.S. Naval Forces Europe area of operations."

While in the Mediterranean, the carrier strike group participated in and supported numerous multinational exercises and vigilance activities to increase NATO capability and deter aggression in the region. The carrier visited ports in Croatia, Greece, Italy, Norway and Türkiye. Other ships in the strike group visited Belgium, Cyprus, Montenegro, Spain and Sweden.

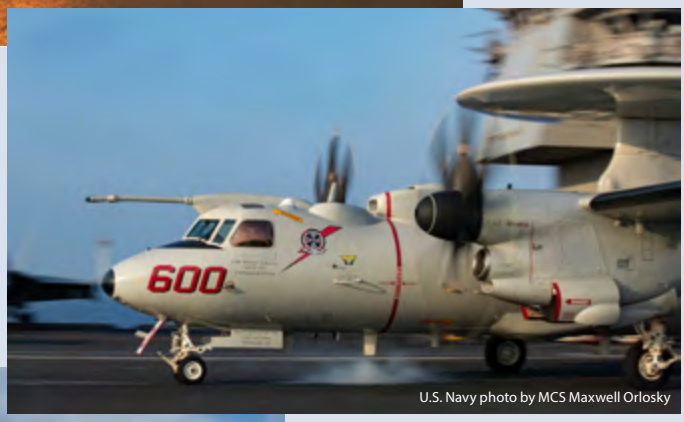
The Gerald R. Ford Carrier Strike Group (GRFCSG) was extended 76 days following the outbreak of conflict in Israel and operated in the Mediterranean Sea to deter further escalation and support Israel in its right to self-defense. Two of the strike group's ships, the Arleigh Burke-class guided-missile destroyers USS McFaul (DDG 74) and USS Thomas Hudner (DDG 116) deployed to the U.S. 5th Fleet area of operations in support of maritime security objectives.

In total, the GRFCSG worked with 17 nations throughout its deployment during exercises Baltic Operations, Air Defender, Bomber Task Force Viking Trident, Neptune Strike and Sage Wolverine. The strike group operated with Standing NATO Maritime Groups 1 and 2, conducted dual-carrier operations with USS Dwight D. Eisenhower (CVN 69), and exercised with navies from France, Greece, Norway, Türkiye and the United Kingdom.

In 239 days underway, the ship's crew conducted 43 underway replenishments, logged more than 17,826 flight hours and 10,396 sorties, sailed more than 83,476 nautical miles, and safely transferred 20.7 million gallons of

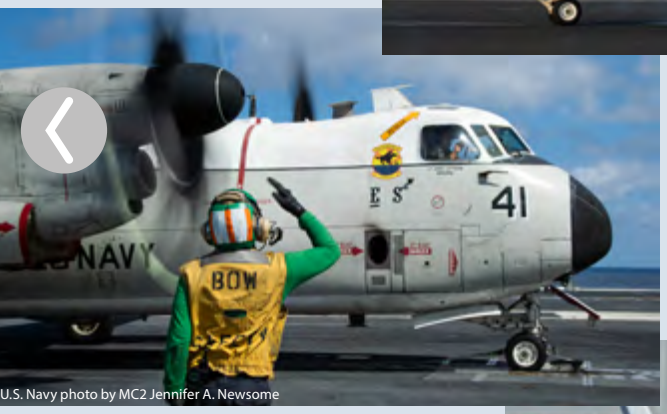
U.S. Navy photo by MC2 Jackson Adkins

An MH-60S attached to Helicopter Sea Combat Squadron (HSC) 9 flies over the Mediterranean Sea, Aug. 16, 2023.



U.S. Navy photo by MCS Maxwell Orlosky

An E-2D Hawkeye, attached to the "Bear Aces" of Airborne Command and Control Squadron (VAW) 124, lands on the flight deck of USS Gerald R. Ford (CVN 78), Aug. 19, 2023.



U.S. Navy photo by MC2 Jennifer A. Newsome

A Sailor assigned to aircraft carrier USS Gerald R. Ford (CVN 78) air department signals to the pilot of a C-2A Greyhound from the "Rawhides" of Fleet Logistics Support Squadron (VRC) 40 on the flight deck, March 24, 2023

U.S. Navy photo by MC2 Nolan Pennington

Aviation Boatswain's Mate (Equipment) 3rd Class Angel Rico, assigned to the "Ragin' Bulls" of Strike Fighter Squadron (VFA) 37, readies an F/A-18E Super Hornet from VFA-37 for launch.

U.S. Navy photo by MC2 Jackson Adkin

An F/A-18F Super Hornet attached to the "Black Lions" of Strike Fighter Squadron (VFA) 213 takes off from aircraft carrier USS Gerald R. Ford (CVN 78), May 31, 2023.

fuel with zero mishaps. The Ford crew conducted 33,444 flight deck moves, 3,124 hangar bay aircraft moves, 2,883 aircraft elevator moves, 16,351 aircraft fueling evolutions, and transferred 8,850 pallets of cargo and mail. The Gerald R. Ford culinary team prepared and served 3.1 million meals, which included approximately 48,000 dozen eggs, 24,000 gallons of milk, 131,000 hamburgers, 367,000 pounds of chicken, and Gerald R. Ford's favorite, 79,000 chocolate chip cookies.

"The Gerald R. Ford is everything our nation hoped it would be, and more. I am so proud of the crew, who breathed life into the world's most technologically advanced warship and stood the watch in defense of our national interests," said Capt. Rick Burgess, Gerald R. Ford's commanding officer. "Though extended, we were the right ship at the right time to answer the call, and our Sailors performed admirably. Ford Sailors honored our namesake's legacies of hard work, integrity and courage."

Sailors and resiliency were at the forefront of Gerald R. Ford's first combat deployment. The ship offered an array of services, including chaplain support, a deployed resiliency counselor and educator, a shipboard Wolverine TV program and daily Wolverine newspaper—an homage to President Ford's alma mater—and command associations and clubs. The Gerald R. Ford deployment also introduced the first military facility working dog to deploy with a U.S. Navy ship, pioneering a pilot program meant to address operational stress and promote morale and resiliency.

Notable visitors to the Gerald R. Ford included U.S. Secretary of Defense Lloyd J. Austin III; U.S. Secretary of the Navy Carlos Del Toro; commanders of Naval Forces Europe-Africa; U.S. 6th Fleet; Naval Striking and Support Forces NATO; the director of exercises and assessments and advisor on reserve component affairs for U.S. European Command; crown prince of the Kingdom of Norway; chief of the Norwegian fleet; and commander in chief of the Italian Navy.

In addition to the carrier, the GRF-CSG consists of CSG-12 staff, Carrier Air Wing (CVW) 8, Destroyer Squadron (DESRON) 2 staff and units, and the Ticonderoga-class guided-missile cruiser USS Normandy (CG 60). In total, the GRFCSG deploys with more than 5,000 Sailors across all platforms ready to respond globally to combatant commander's tasking.

The ships of DESRON 2 are the Arleigh Burke-class guided-missile destroyers USS Ramage (DDG 61), USS McFaul (DDG 74) and USS Thomas Hudner (DDG 116).

The squadrons of CVW-8 embarked aboard Gerald R. Ford are the "Tridents" of Helicopter Sea Combat Squadron (HSC) 9, the "Bear Aces" of Airborne Command and Control Squadron (VAW) 124 and the "Rawhides" of Fleet Logistics Support Squadron (VRC) 40 located in Norfolk, Va.; the "Ragin' Bulls" of Strike Fighter Squadron (VFA) 37, the "Blacklions" of Strike Fighter Squadron (VFA) 213, the "Golden Warriors" of Strike Fighter Squadron (VFA) 87 and the "Tomcatters" of Strike Fighter Squadron (VFA) 31 located in Virginia Beach, Va.; the "Gray Wolves" of Electronic Attack Squadron (VAQ) 142 based in Whidbey Island, Wa.; and the "Spartans" of Helicopter Maritime Strike Squadron (HSM) 70 from Mayport, Fla.

Gerald R. Ford is the U.S. Navy's newest, largest, and most advanced aircraft carrier. As first in its class, the ship represents a generational leap in the U.S. Navy's capacity to project power on a global scale. Ford-class aircraft carriers introduce 23 new technologies, including Electromagnetic Aircraft Launch System (EMALS), Advanced Arresting Gear and Advanced Weapons Elevators. The new systems on Ford-class ships are designed to generate a higher sortie rate with a 20 percent smaller crew than a Nimitz-class carrier, paving the way for future Naval Aviation.

Petty Officer 1st Class Brian Glunt is a member of the USS Gerald R. Ford (CVN 78) public affairs office.

U.S. Navy photo by MC2 Jackson Adkins

Sailors assigned to aircraft carrier USS Gerald R. Ford (CVN 78) and Carrier Air Wing (CVW) 8 prepare to launch two F/A-18E Super Hornets from the "Golden Warriors" of Strike Fighter Squadron (VFA) 87 and the "Ragin' Bulls" of VFA-37, May 15, 2023.

U.S. Navy photo by MC2 Nolan Pennington

An F/A-18E Super Hornet from the "Tomcatters" of Strike Fighter Squadron (VFA) 31 launches from the flight deck of aircraft carrier, USS Gerald R. Ford (CVN 78).

U.S. Navy photo by MC2 Nolan Pennington

Lt. Evan Ladner signals to launch an E/A-18G Growler attached to the "Gray Wolves" of Electronic Attack Squadron (VAQ) 142.

U.S. Navy photo by MC2 Nolan Pennington

An MH-60R Seahawk helicopter attached to the "Spartans" of Helicopter Maritime Strike Squadron (HSM) 70 prepares to land on the flight deck, Oct. 9, 2023.

The PEP in CAEWWS' Step

By Petty Officer 1st Class Ryan Batchelder

In the sunny high desert of Northern Nevada, one Sailor is having a much different experience than he usually would have.

Lt. Cmdr. Tom Rixon, from High Wycombe, England, currently assigned to Naval Air Station (NAS) Fallon's Naval Aviation Warfighting Development Center (NAWDC), Carrier Airborne Early Warning Weapons School (CAEWWS), is a Personnel Exchange Program (PEP) participant from the British Royal Navy. He recently had his last flight in the program on Jan. 26.

"Taking my last flight was a surreal feeling after my time here," Rixon said. "Leaving behind the familiar and embracing something new and unknown has been eye-opening, and I'm grateful for the opportunity to collaborate in this partnership."

The program, which is more than 50 years old, was announced in a "Z-Gram" from the 19th Chief of Naval Operations, Adm. Elmo Zumwalt, to enhance international and interservice relationships by providing exchange opportunities for officers and enlisted personnel.

"We at CAEWWS have been participating in the program for more than 30 years now," said CAEWWS' Department Head Cmdr. Joshua Goodin. "When I was on staff 10 years ago, we always had a Royal Navy PEP participant, generally in an instructor position. I returned to Fallon in August of 2023, and in the three-and-a-half years total that I've been here, 10 Royal Navy Observers have come through the program, and I've known six personally."

Rixon started his first six months in Virginia Beach, Virginia, qualifying for the E-2C Hawkeye and E-2D Advanced Hawkeye airborne early warning aircraft. As an Air Battle Manager and Naval Flight Officer, his remaining time at NAS Fallon, Nevada, as a warfare tactics instructor has seen him integrate effortlessly into the installation's airborne early warning community, providing invaluable knowledge and instruction.

"My time at CAEWWS has been extremely fulfilling," Rixon said. "The ability level and expertise that I've seen and been a part of here is second to none. Taking these personal experiences back to the U.K. I think will be a significant benefit for both countries."

According to Goodin, working alongside a different country's military can sometimes present challenges. For CAEWWS, the partnership with the Royal Navy has been essentially seamless.

U.S. Navy photos by Gavin Graham

An E-2C Hawkeye, assigned to Naval Aviation Warfare Development Command (NAWDC) Carrier Airborne Electronic Warfare Weapons School (CAEWWS), taxis on the runway at Naval Air Station Fallon, Nevada, Jan. 26.

"[Rixon] is the best of the best, and we've been very fortunate to have him as an instructor," Goodin said. "He values performance and professionalism and is a fantastic leader. He's a testament to the excellence the Royal Navy sends here to Fallon for the PEP. They value the integration between the U.S. and the U.K. as much as we do, and it's a great opportunity to work and learn alongside some of our closest allies."

Overall, the experience for Rixon has been beneficial in more ways than one.

"I arrived as a single guy, and I'm leaving happily married," said Rixon, who married his wife Hannah in 2023. "Developing these relationships, both personally and professionally because of this program, has been rewarding in every sense. I'm grateful for this vast community of aviation professionals and fellow instructors that help keep both countries on the cutting edge."

Capt. Shane Tanner, NAS Fallon commanding officer, echoed his sentiments about the PEP program.

"I have personally worked alongside four U.K. PEP officers attached to CAEWWS over the past 25 years—call signs 'Titus' Tite, 'Mickey' Spillane, 'Errol' Flynn, and now 'Sicko' Rixon," Tanner said. "All of them are stellar Naval Officers and consummate aviators possessing a true warrior ethos. The unique professional expertise that these individuals bring to the NAWDC mission of 'Training the Fleet' in advanced warfight-

ing tactics is indispensable to the joint fight. Moreover, they continue to reinforce the longstanding and historic maritime bond that the U.S. shares with the U.K. And lastly, I am proud to consider them personal and family friends."

Petty Officer 1st Class Ryan Batchelder is a commuications specialist with Naval Air Station Fallon, Nevada.

From left to right, assigned to Naval Aviation Warfare Development Command (NAWDC), Carrier Airborne Electronic Warfare Weapons School (CAEWWS), U.S. Navy Lt. Nicholas Tucker, U.S. Navy Lt. Zachary Verissimo, British Royal Navy Lt. Cmdr. Tom Rixon, U.S. Navy Cmdr. Joshua Goodin, and Naval Air Station (NAS) Fallon Commanding Officer Capt. Shane Tanner pose for a photo on the flightline at NAS Fallon, Jan. 26.

Naval Postgraduate School POTION Software Helps UAV Break Records During Arctic Test Flight

By Petty Officer 2nd Class Leonard Weston

Following years of dedicated work with unmanned aerial vehicles (UAVs), Naval Postgraduate School (NPS) and Naval Research Laboratory (NRL) partners have successfully concluded the ultimate test of a nine-year continuum of research and development in one of the world's most challenging environments: the Arctic Circle.

The collaborative team integrated NPS' own cutting-edge flight-path planning software known as POTION (Path Optimization) with the Vanilla UAV, developed and operated by Platform Aerospace. This initiative pushed the boundaries of their research, subjecting the Vanilla-POTION combination to rigorous testing in the daunting North Slope of Alaska, making the best of a narrow weather window.

Remarkably, the outcomes of the Arctic flight in September surpassed all expectations, as well as numerous records set by Vanilla in previous missions. This achievement underscores the exceptional capabilities of the Vanilla-POTION combination and represents a milestone in advancing UAV technology for naval operations within the scope of the long-term partnership.

Leading NPS efforts on what he terms "energy-aware aerial flight" is NPS Associate Professor of Mechanical and Aerospace Engineering (MAE) Dr. Vladimir Dobrokhodov, who began at NPS as a postdoctoral fellow in 2001.

"A glider's efficiency is quantified by its judicious energy utilization, a stark contrast to the combat efficiency metrics applied to fighter aircraft. Similar to transport planes, gliders aim to traverse vast distances with minimal fuel consumption," Dobrokhodov said. "Over a meticulous nine-year collaboration between NPS and NRL, innovative approaches have been developed to optimize efficiency of long endurance aircraft."

Back in 2014, Dobrokhodov worked alongside NRL's Dr. Dan Edwards and Dr. Richard Stroman to explore energy-aware flight research with a novel hybrid UAV called Hybrid Tiger that integrated hydrogen fuel cell, solar and atmospheric wind energy-harvesting technologies.

The project spanned three years and received funding from the Operational Energy Capability Improvement Fund (OECIF), the Department of Defense's premier joint operational energy investment program, as well as support from DOD's Operational Energy Prototyping Fund (OEPF), which played a key role in development of energy-focused mission planning tools. Eventually, the initiative evolved into the energy-aware project called POTION.

Central to the project's achievements was the development of optimal trajectory planning software emulating the energy-conserving flight patterns of migrating birds navigating atmospheric wind rivers. In the realm of energy-efficient flight, characterized by low airspeeds and altitudes, susceptibility to the adverse effects of strong winds and icing is amplified, making flight-path planning extremely challenging for human operators. Mathematical optimization of routing becomes vital, necessitating a complex software solution that enables the aircraft to skillfully navigate through diverse and potentially hazardous weather conditions.

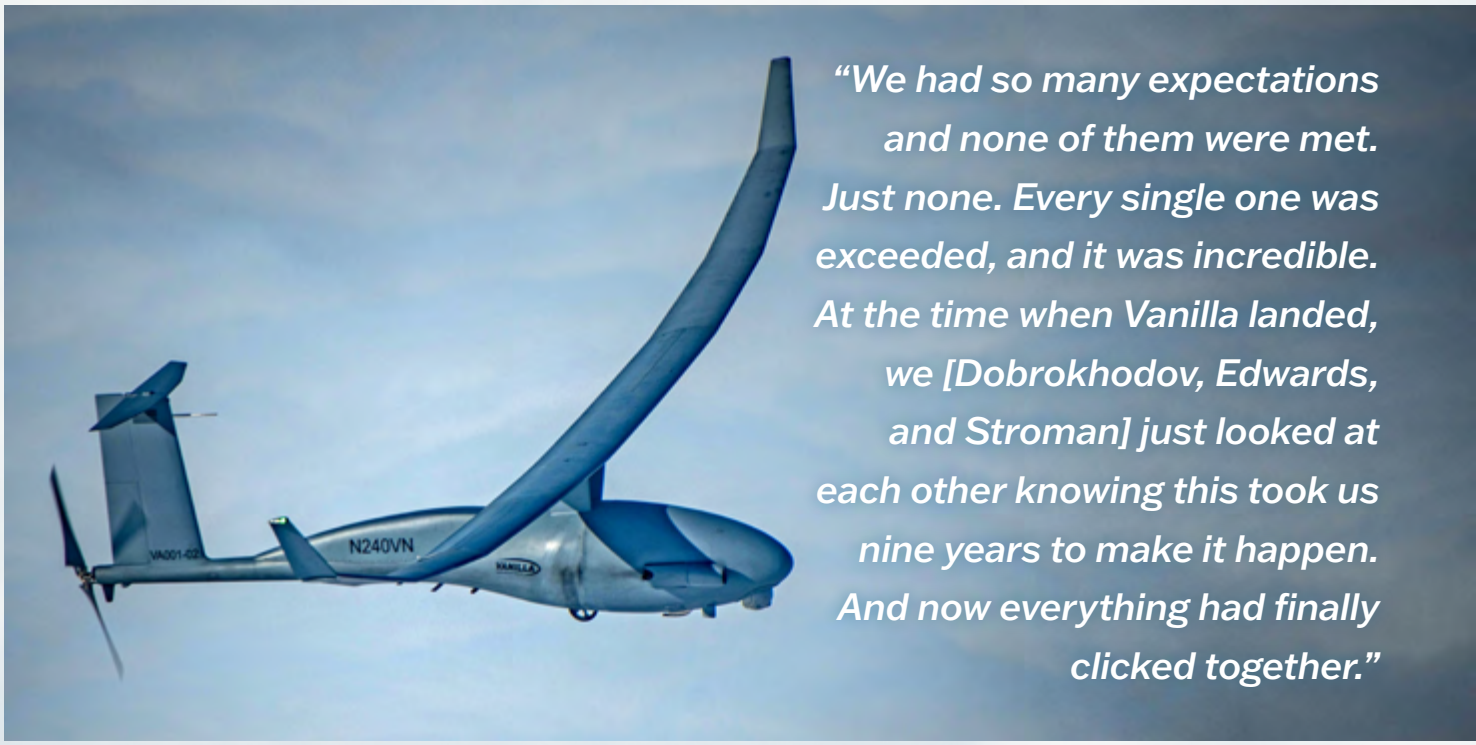
Close collaboration with MAE professors Mark Karpenko and Kevin Jones, researchers who have spent years in the area of flight efficiency and optimal control engineering, helped to advance the energy optimal approach to what is now POTION. The team developed the propulsion efficiency model of an aircraft to model the Vanilla UAV's fuel consumption and used machine learning to integrate that model into the algorithm for route optimization.

"Using neural networks to represent and quickly execute an otherwise complicated energy model was a key enabler for optimizing Vanilla's flight path," Karpenko said.

Weather forecasts from Naval Meteorology and Oceanography Command (METOC) were used to inform multi-day missions of the weather conditions ahead. Just as with ships, an aircraft might waste precious energy flying directly into headwinds even if it is a more direct flight path. POTION designs a mission that finds the most energy-advantageous route through

A Vanilla ultra-endurance land-launched unmanned aerial vehicle (UAV) operates during U.S. Pacific Fleet's Unmanned Systems Integrated Battle Problem (UxS IBP) 21 at Naval Base Ventura County, Point Mugu, California.

U.S. Navy photo by Michael Schut



U.S. Navy photo by Michael Schutt

"We had so many expectations and none of them were met. Just none. Every single one was exceeded, and it was incredible. At the time when Vanilla landed, we [Dobrokhodov, Edwards, and Stroman] just looked at each other knowing this took us nine years to make it happen. And now everything had finally clicked together."

A Vanilla ultra endurance land-launched unmanned aerial vehicle (UAV) operates during U.S. Pacific Fleet's Unmanned Systems Integrated Battle Problem (UxS IBP) 21 at Naval Base Ventura County, Point Mugu, California.

time-varying three-dimensional winds by referencing METOC weather forecasts that extend up to five to eight days.

To test the POTION software, researchers needed a unique aircraft to host the technology, and found one in Vanilla, a Group III UAV. Vanilla UAVs have a maximum endurance of 10 days, a payload capacity of 150 pounds and a maximum range of 15,000 nautical miles. Vanilla's capability for long endurance flight makes it especially suitable for realistic testing of its flight performance in wind and icing conditions, and thus a prime candidate for testing the POTION software.

Originally, flight testing was to be conducted in California, but a last-minute change necessitated launching the Vanilla UAV from Alaska's North Slope—above the Arctic Circle—in rough weather. Typically, Vanilla is required to be "chased" by a manned aircraft in the terminal area of airports, but the weather was so intense that the escort aircraft could not take off. Instead, Vanilla was given a chance to fly using Instrument Flight Rules (IFR) fully autonomously and following the POTION-generated routes.

"In the most severe arctic conditions, Vanilla demonstrated exceptional performance, achieving unprecedented milestones in its operational history. Notably, it set records for the longest duration flown by a Vanilla aircraft in Arctic environments, covered the greatest distance at these latitudes, and marked its inaugural operation utilizing Instrument Flight Rules (IFR)," Dobrokhodov said. "We had so many expectations and none of them were met. Just none. Every single one was exceeded, and it was incredible. At the time when Vanilla landed, we [Dobrokhodov, Edwards, and Stroman] just looked at each other knowing this took us nine years to make it happen. And now everything had finally clicked together."

In honor of the 101st flight by a Vanilla UAV and its unique location, the team named the flight Arctic 101. According to Karpenko, "Arctic 101 was also a fitting name for our first flight because we learned a lot, especially about deploying POTION software in the 'wild.'"

By adding NPS' POTION software to the Vanilla UAV, the team was able to significantly extend its endurance, and extending UAV endurance bears profound implications for military operations.

In this respect, the POTION software developed by NPS stands as a pivotal tool, facilitating the automation of mission optimization involving long-endurance aircraft deployment from a base, navigating to a designated location for extended loitering, and subsequently returning to base. This versatile software is compatible with diverse aircraft platforms and could be seamlessly integrated with nearly any ground control station.

The operational scenario in the Arctic also showcased the transformative potential of POTION. Notably, it effectively mitigated the operator's cognitive load associated with the intricate multi-day mission design and management

process, marking a substantial advancement in operational efficiency.

The POTION research initiative has proven instrumental in advancing the knowledge base of numerous NPS students. During the past three years, seven students in diverse NPS departments have chosen operational energy and its efficacy in aircraft applications as the focal point of their thesis topics.

While some students originated from the MAE department—including U.S. Navy Ensign Luke Lalumandier, a June 2023 graduate whose work focused on the energy-optimal guidance of UAS systems in varying wind environments—it is noteworthy that Operations Research students in particular have significantly contributed valuable insights into the realm of optimization at the mission level. One such OR student was Marine Corps Maj. Tyler Cotney, another June 2023 graduate whose thesis dealt with real-time solutions of robust, energy-aware UAV routing.

Dobrokhodov underscores his appreciation for the contributions from students across various disciplines.

"Active student engagement constitutes a cornerstone NPS endeavor. Many NPS students come in from the fleet. A lot of them already have operational experience flying UAVs, and they give us fruitful thought and advice on how UAVs should be operated. In part, the success of this project is also the success of our students. They come to NPS, learn from us, but, also, we learn from them. That's a significant part of what we all do here," Dobrokhodov said.

Although no NPS students were able to take part in the Arctic testing in September, NPS is already looking to incorporate results from the POTION research into a new project with opportunities for students and research partners alike. Another proposal for NPS, NRL and Platform Aerospace was recently awarded $7.5 million by OECIF for a project entitled GUIDER (Guidance of UxS: Intelligent, Energy-aware Routing) that will be a natural extension of the work done with Vanilla, hopefully extending its applicability to a wider class of autonomous aircraft.

"We want to integrate the energy savings attained during transit to and from the operational zone with the aircraft's energy-aware performance during the mission execution phase," Dobrokhodov said of his goals for the GUIDER project. "The question is how we can extend the energy efficient flight into typical mission tasks, like searching a huge area of the south Pacific, for example. Using what we have learned in the Arctic experiment, we can now study how to perform a large-scale search, optimally with respect to fuel and energy and apply that knowledge to other aircraft."

Use of the Vanilla UAV in research conducted by the Naval Postgraduate School does not constitute endorsement of Platform Aerospace or its products or services by NPS, the Department of the Navy, or the Department of Defense.

Petty Officer 2nd Class Leonard Weston is a communications specialist with the Naval Postgraduate School.

U.S. Navy photo

A team of researchers from Platform Aerospace, the Naval Postgraduate School (NPS) and the Naval Research Laboratory (NRL) recently used a Platform "Vanilla" unmanned aerial vehicle (UAV) to conduct testing of flight-path planning software developed at NPS.

UP IN THE AIR

Landing Signalman Enlisted Qualifications Keep the Deck Moving Safely

By Petty Officer 2nd Class James Finney

An Aviation Boatswain's Mate Handling (ABH) has many responsibilities aboard USS Boxer (LHD 4). The role ranges from directing movement of aircraft and conducting maintenance on ground-handling equipment, to training for crash and salvage rescue operations.

The rate also includes the Landing Signalman Enlisted (LSE) qualification. During flight operations, the LSE has been described as being the quarterback on a football field—calling the shots and leading the pack.

Flight operations are loud, windy and a constant whirlwind of aircraft taking off, landing and maneuvering on the deck while personnel move quickly and efficiently to service them. For an LSE, this means operating safely and efficiently as they supervise operations on the flight deck.

"It's dangerous because anything can happen at any given time," said Aviation Boatswain's Mate 2nd Class Johnny Snowden. "The job can be repetitive, so if you don't maintain your focus and situational awareness, you could jeopardize the safety of the whole flight deck crew."

Pilots depend heavily on the LSE to perform safe launches and landings on the flight deck aboard a moving ship. He or she ensures that, on signal, aircraft are safely started, engaged, armed, launched, recovered, disarmed, shutdown and that all tie downs are removed prior to lift-off and secured after landing.

"As a pilot, what the LSE provides for me is peace of mind so I can perform my job safely," said Lt. Gerold Hausmchild, an MH-60S Seahawk pilot. "Observing flight operations is much different from being a part of them, that's why LSEs hold such an important role on the flight deck."

For a pilot, it is the last piece of assurance they need before landing or taking off. Haumschild said that LSEs on an amphibious ship bear a lot of responsibilities when compared to other ships. Whether they are signaling an MH-60S Seahawk, F-35 Lightning II or an AH-1Z Viper attack helicopter, it is a massive feat. The complexity behind every call and hand signal is vast. There are numerous safety precautions an LSE must follow to keep the flight deck crew and pilots safe. LSEs must go through rigorous training before becoming fully qualified. They first go to a week-long LSE School where they learn the basics such as hand signals, safety precautions and situational awareness. After completing the school, they shadow a qualified LSE under instruction until they can master the craft. When they are ready, they complete a board with their chain of command covering everything they've learned to ensure they are qualified for the position.

"This job is so dynamically complex, you can't be the same person you were coming into the Navy. Self-growth and the ability to mold your mindset allows you to do this job," said Aviation Boatswain's Mate 3rd Class Breon Shields.

The LSE, under the supervision of the Air Office, is responsible for signaling the pilots flying the aircraft with sharp and precise hand movements. They assist the pilot in making a safe takeoff or approach on the flight deck. The LSE is responsible for directing the pilot to the desired parking spot and following

U.S. Navy photo by MC3 Michael T. Eckelbecker

Aviation Boatswain's Mate (Handling) Airman Fernando Portugal signals to the pilot of an MV-22 Osprey, assigned to Marine Medium Tiltrotor Squadron (VMM) 166 (Reinforced), as it prepares to land on the flight deck of amphibious assault ship USS Boxer (LHD 4).

safety precautions to protect the flight deck crew.

"We have to ensure the vicinity of the aircraft is clear and safe," said Aviation Boatswain's Mate 2nd Class Alfonso Gonzalez. "That is just a fraction of the precautions and safety checks we must perform before any takeoff or landing."

Just like the blades of an MH-60S Seahawk—always spinning and in a dynamic state—the same goes for the qualified LSEs aboard a ship. They are reliable, skilled and essential for flight operations.

Petty Officer 2nd Class James Finney is a member of USS Boxer public affairs.

FRCE Leading Organic Manufacturing Efforts Across Department of Defense

When supply chain constraints make it challenging to source parts for aircraft maintained at Fleet Readiness Center East (FRCE), the depot's organic manufacturing capabilities allow FRCE to continue to return mission-ready aircraft to the fleet.

Sometimes, parts become unobtainable through traditional acquisition methods employed by the Defense Logistics Agency, the Department of Defense's demand and supply management organization. In cases like these, FRCE's Manufacturing Machine Shop is called upon to step in and bridge the gap by manufacturing the items on-site at the depot, a process also referred to as organic manufacturing. The shop and its crew of skilled machinists offer capabilities in service of military aviation readiness around the globe.

According to Cmdr. Blake Dremann, the depot's supply officer, FRCE produces about 75 percent of the organic manufacturing completed across the Commander, Fleet Readiness Centers (COMFRC) enterprise. COMFRC consists of nine Fleet Readiness Centers, including FRCE, that conduct maintenance, repair and overhaul of U.S. Navy aircraft, engines, components and support equipment.

Over the past three years, this in-house manufacturing has translated into approximately $19 million in parts manufactured at FRCE. That represents around 10 percent of FRCE's annual materials cost, Dremann said, but the larger benefit of the depot's organic manufacturing capability lies in its ability to resolve supply issues that could otherwise keep aircraft grounded.

"It's not a huge portion of the work that we do, cost wise," Dremann said. "But the real impact of our organic manufacturing capability is that it's a readiness enabler. We've had a lot of really big successes in that realm."

Cmdr. David Odom, officer-in-charge of DLA Aviation at Marine Corps Air Station Cherry Point, North Carolina, said the organic manufacturing partnership between FRCE and DLA has proven beneficial to both commands and their customers on the flight line.

"As a team, FRC East and DLA have worked together to max out organic manufacturing opportunities for emergent requirements on the production line and future planning gaps for retail shelf stock," Odom said. "To date, FRC East has been leaning forward in this capacity, and is at the top of the list for maintenance, repair and overhaul facilities across the services and the Department of Defense."

The parts manufactured at the FRCE have a measurable impact on Naval Aviation readiness, whether those parts are used at FRCE or sent to DLA to fulfill orders from the Fleet, said Don Jeter, Planning and Operations Division director within the depot's Centralized Coordination Department.

"We have a pretty robust organic manufacturing program

U.S. Navy photos

Dustan Brown, a machinist in the Manufacturing Machine Shop at Fleet Readiness Center East (FRCE), monitors progress of one of the depot's computerized numerical control lathes as it machines an offset pin for use in an AV-8B Harrier.

A computerized numerical control lathe at Fleet Readiness Center East (FRCE) manufactures an offset pin for use on an AV-8B Harrier.

here at FRC East. We manufacture a huge number of piece parts; throughout the enterprise, probably around three-quarters of what's being manufactured in support of the warfighter, we do here locally," Jeter said. "While the dollar value of those parts isn't an astronomical number, their impact to the fleet can't be ignored."

When DLA has exhausted traditional acquisition avenues and requests manufacturing support from FRCE, there is a great deal work that goes into planning, modeling and testing before the order ever reaches the depot's machinists. Once production begins, FRCE's machinists often complete orders of just one or two pieces, said Matt Sinsel, head of the Manufacturing, Machining and Welding Branch—which is part of why the depot's organic manufacturing capability is so important.

"What's unique about us is that we can produce the one-off parts, the onsies and twosies," he said. "When you go out into private industry, they often want to see orders in bulk. There's more money in running a thousand of the same part on a console. The engineering and programming costs are involved no matter how many pieces you're producing. A lot of vendors in private industry aren't willing to do that for one-off parts and, if they are, there might be an astronomical price associated with it.

"We're different," Sinsel said. "We know our capability provides a stopgap, and we've invested in that."

The skill and professionalism of FRCE's machinists allow the depot to produce a wide range of parts using a variety of methods and equipment, said Jeff Norman, Manufacturing Machine Shop supervisor.

"One day, they might be running a five-axis computer numerical control machine, and then next week they're traveling to another location to fix something on an aircraft," he said. "These artisans are not just machine operators—they are, in fact, machinists, and they have the capabilities and bandwidth to do it all.

"They're very dedicated in what they do," Norman said. "I've never experienced the level of ownership that this team has in their day-to-day operations and in what's expected of them. They take it and they own it completely, 100 percent, knowing that their capabilities can get an aircraft back in service to the fleet. I can't say enough good about them and the work they do, and my hat's off to them, absolutely."

At FRCE, this type of manufacturing-on-demand conducted to fill supply gaps is most common for the legacy aircraft maintained at the depot, including the CH-53E Super Stallion and the AV-8B Harrier. Without the FRCE's manufacturing capabilities, some of the parts needed for these aircraft might become impossible to source.

"The work we do helps prolong the life of an aircraft system or mission system," Sinsel said. "It's hard to sustain some of these aging aircraft, but the parts we produce through organic manufacturing help these aging aircraft reach their full life limit and mission execution."

Jeter agreed that the capability provides an often-overlooked, but necessary, component of military aircraft maintenance, repair and overhaul.

"We're going above and beyond in our support of the warfighter, and that's exactly what we exist for," he said. "We're the last resort to keep the warfighter flying, and that's what we do."

U.S. Navy photos

Jeffrey Norman, supervisor of the Manufacturing Machine Shop at Fleet Readiness Center East (FRCE), and machinist Dustan Brown inspect a piece of cobalt that will be used to manufacture offset pins for an AV-8B Harrier.

Jack Forehand, a machinist in the Manufacturing Machine Shop at Fleet Readiness Center East (FRCE), scans for potential errors as a rendering of a tool path for an H-53 aft cabin fitting plays through prior to running the part on a five-axis computerized numerical control mill.

F-16 Falcon to Become Part of FRCSW Maintenance Program

Fleet Readiness Center Southwest (FRCSW) is ushering in a new era of Naval Aviation as the Navy continues the gradual retirement of its legacy F/A-18A-D series. The renowned F-16 aircraft is poised to become a major program for the FRCSW Depot team's operations. The F-16, known as the "Fighting Falcon," has been a mainstay in air forces globally since its inception in the 1970s. Designed as a multi-role fighter, its versatility and state-of-the-art avionics have rendered it indispensable in aerial combat and strategic missions.

As the F/A-18 series approaches its retirement, FRCSW is gearing up for the inclusion of the F-16 "Fighting Falcon" in its maintenance fold. In February 2023, the Air Force repair capacity had reached its maximum so the Specialized and Proven Aircraft Program Office, the F-16 program office, reached out to FRCSW leadership in order to assess its capability and capacity. After several visits and meetings with leadership, the program office decided to entrust FRCSW with the task of establishing a depot repair line for the F-16 C and D models. This critical decision placed the responsibility on the shoulders of FRCSW's MRO-E Offsite Division Head, Jacob Weintraub. Weintraub, an experienced engineer with over 20 years working on Hornets, now oversees the F-16 engineering and overall setup at various FRCSW locations, including Marine Corps Air Station Miramar, California, Naval Air Station (NAS) Lemoore, California, and NAS Whidbey Island, Washington. This transition, while daunting, is not insurmountable. Weintraub's comprehensive understanding of Navy maintenance processes, coupled with his adept technical background, ensures that the F-16's unique maintenance requirements will be made.

Unlike the scheduled maintenance for the F/A-18, the F-16's maintenance approach is based on discovery and then repairing what is found. Despite the difference in approach to maintenance for the two aircraft, the organic capabilities and expertise of FRCSW engineers and artisans promises a smooth transition to this operation. The structural similarities between the F-16 and the F/A-18 A-D model—both designed in the same era—mean that their repair techniques and engineering interpretations align. This synergy provides a unique advantage to FRCSW, potentially making the command an attractive option for future Air Force repair workload. Technologically, under the supervision of FRCSW, the F-16s will undergo structural inspections to ensure they meet their certified design lifespan. Additionally, the recent inclusion of in-service repair (ISR) capabilities on this aircraft enables FRCSW to provide depot repair maintenance at places like Naval Air Station Fallon, Nevada. Maintenance of ISR capabilities within an aviation fleet often occurs reactively, without a pre-established schedule. For instance, when F-16 units stationed at Naval Air Station Fallon need depot-level maintenance, they initiate the process by submitting a P&E (planning and estimation) request. This action triggers a meticulous in-service repair process, ensuring that any malfunctions are addressed with precision, thereby maintaining the aircraft's readiness for essential duties such as mission execution and pilot training. This strategy of conducting repairs on-site effectively precludes the need to send aircraft to remote depots. Beyond safeguarding operational safety, this approach strategically alleviates certain workload on FRCSW maintenance artisans. It ensures that comprehensive ISR depot maintenance is concluded before any

An F-16 awaits to be unveiled and serviced at FRCSW.

U.S. Navy photo

aircraft arrives at the facility, thereby aiding in the adherence to FRCSW's stringent maintenance timelines, budgets, and specifications.

In collaboration with the program office and the command's sister depot Fleet Readiness Center Southeast (FRCSE), the FRCSW team has diligently gathered crucial insights, integrating them into the F-16 program's framework. In preparation for the new F-16 maintenance program, the team has focused on comprehensive planning measures. These include developing specialized training for the artisans, securing the necessary technical documentation, amassing a robust inventory of supplies and components, and forming a cohesive, interdisciplinary team. Such strategic planning forges a solid foundation for this new depot capability at FRCSW, ensuring the program's launch and continued success with a greater degree of assurance and expertise.

Establishing a new maintenance line of repair is a large task, but Weintraub finds immense satisfaction in collaborating with an experienced and motivated team. He emphasizes that the real mission goes beyond mere repairs: it's about providing safe and ready aircraft for training and defense, underscoring the importance of timeliness, budget adherence, and above all, ensuring the nation's defense capabilities remain robust. Weintraub, like the majority of FRCSW employees, is motivated by the overarching goal: to ensure the men and women of the United States military are provided with the tools necessary so that pilots are successful in their real-world scenarios using the F-16 aircraft. With the unwavering support from senior FRCSW and program office leaders, the F-16 project at FRCSW isn't just about transitioning to a new aircraft; it's about fortifying the future of United States aviation defense.

Fleet Readiness Center Southeast F414 Engine Product Line Soars Past NAE Engine Readiness Goal

Fleet Readiness Center Southeast (FRCSE) was a key contributor to surpassing the Naval Aviation Enterprise (NAE) F414 Engine Readiness Goal (ERG) of 1,451 ready-for-issue (RFI) engines for the first time since 2018—eight months ahead of the planned recovery schedule. The achievement was a joint effort between FRCSE, the F/A-18 and EA-18G Program Office, Naval Supply Systems Command, Defense Logistics Agency, General Electric and other organizations.

"By collaborating with several organizations, revisiting key processes and tapping into the power of our Fleet Support Team (FST), the F414 team wasn't just able to overcome a significant backlog of engine demand, but achieved it record time," said FRCSE Commanding Officer Capt. Al Palmer. "It's a true testament to FRCSE's ability to dissect a problem and create innovative solutions to meet fleet demands."

The F414 engine, the power behind the Navy's twin-engine F/A-18E/F Super Hornet and EA-18G Growler, is a turbofan engine manufactured by General Electric (GE) capable of producing 22,000 pounds of thrust. It has been a staple workload at FRCSE for more than two decades.

As the Navy's sole source of repair for the F414 engine module, FRCSE rose to meet the lofty NAE goal of 341 mission-capable Super Hornets outlined during fiscal year (FY) 2019, but the upsurge in engines required to hit the goal put a strain on all aspects of the program, resulting in engine module shortages and sending RFI F414s in a downward trajectory.

The FY 2019 goal meant the command needed to ramp up production efforts on all six F414 modules: the fan, high-pressure compressor (HPC), combustor, high-pressure turbine (HPT), low-pressure turbine (LPT) and afterburner, which ultimately depleted the available stock of components and parts, creating a kink in the supply chain. As the Navy worked to purchase and deliver more parts, FRCSE fought to sustain mission-capable aircraft.

U.S. Navy Photos by Toiete Jackson

Quality Assurance Specialist Hugo Rodriguez performs a final inspection prior to reassembling an F414 High Pressure Compressor Stator (HPC).

"From fiscal year 2019 to 2023, the F414 ecosystem was challenged to avoid letting engine numbers drop to bare firewall levels, while simultaneously increasing output to achieve ERG," said Matt Lindberg, FRCSE's Engines Production Line Director. "The increase put a strain on the supply system, which couldn't fully recover until fiscal year 2023 and 2024."

Every aircraft engine plays a vital role in our military's ability to remain ready to fight. However, considering the F414 is the power behind the Navy's primary strike fighter aircraft, the need for innovative ideas to keep engine modules built and aircraft flying demanded creativity and a hard look at processes, FST efforts, workflow and personnel.

The first step was to leverage subject matter experts. The F414 team found that by looking through the lens of the Naval Sustainment System and using the Navy's "Get Real, Get Better" principles, they could significantly increase production.

They started by reallocating personnel—increasing the artisan workforce by 23 percent and support staff by 10 percent. While this step was vital to the overall outcome, the team struck gold when they evaluated the kitting stage of repair.

"The kitting process can begin when all parts are accounted for to make a complete component or module assembly," Lindberg said. "Production controllers gather the parts and put them in a specifically designed cart that is rolled out to the artisan to build. While it seems like a simple tactic, each module within the F414 engine has

hundreds of unique parts. We focused our efforts in process improvement around this procedure because once the artisan receives the kit, they are able to build it quickly."

To keep the fine-tuned kitting process running smoothly, the team adjusted the focus of daily meetings and used various communication tools to make expectations clear and keep track of all parts.

"The new method ensured that parts routed were tracked effectively through industrial processes, and it also became easier to manage shortages and pinpoint issues in advance," Lindberg said. "Ultimately, this led to an increase in module output of 35 percent."

Simultaneously, in early 2023, a foundation was laid for FRCSE's F/A-18 Propulsion FST by way of a weekly NAE F414 conference call known as HUD, a weekly, enterprise-wide conversation to address and curtail F414 issues from every level of maintenance—organization (O) level, intermediate (I) level and depot (D) level.

While FRCSE is a D-level facility and in-depth provider of maintenance, repair and overhaul of these engines, issues occurring external to the depot directly affect whether the command can meet its goals.

Consequently, as the F414 team struggled to meet RFI module demand, FRCSE's FST evaluated issues at the O and I levels in an attempt to eliminate constraints at other levels of maintenance.

The team found that by supporting life limit extension on several key scheduled engine removal (SER) drivers, and by leaning into Reliability Centered Maintenance (RCM), a specific, data-driven approach to evaluate a situation or solve a problem, engines could be kept on wing longer.

"By increasing life limits on two dozen critical subcomponents within the F414's six modules, the team could drive down engine removals happening at the O-level, helping to cushion module supply at the I-level and, subsequently, keeping depot-level production advancing," said David Renn, F/A-18 Propulsion FST Lead. "These changes are forecasted to decrease SERs by 10 percent over the next 10 years, resulting in more than $400 million in projected savings to the fleet. Since implementing the changes, SERs have decreased by over 35 percent. This reduction had an immediate and direct impact on ERG."

Turbine Power Plant Mechanic Linus Nyamoko blends the first and second stage brisk of an F414 High Pressure Compressor Stator (HPC).

Furthermore, the team designed a dynamic digital tool to cut down on artisan time and predict usable Composite Outer Bypass Duct (COBD), an area of the engine most commonly connected to unscheduled in-depth repair. The COBD is a structural component of the engine within the HPC that acts as a pressure vessel containing

Aviation Machinist's Mate 3rd Class Natalie Burgos, assigned to FRCSE Detachment Jacksonville, and Aircraft Ordnance System Repairer James Quiett with FRCSE's engine production team, disassemble an F414 High Pressure Combustion (HPT) Engine Module.

engine bypass air. It also, simultaneously, works as an attachment point for several control and accessory components.

The tool assigns scores to COBDs located within modules that were not ready-for-use. Any usable COBDs are extracted from non-usable modules and reallocated. The FST team delivered the tool to FRCSE Planners and Estimators in May 2023 and trained them on its usage shortly after that.

"This tool increased the usable COBD rate from a historical recover rate of 35 to 76 percent because artisans were no longer wasting time on repairs that would never come to fruition," Renn said. "An additional 41 COBDs were extracted from non-RFI modules, removing the COBD barrier."

From May to October 2023, back orders on engine module parts decreased from 338 to zero, and subsequently, the program reached its ERG of 1,451 RFI engines by November 2023—for the first time in over five years. The milestone represents the most RFI engines available since the command started working on the engine in 2002.

"We played our part in getting things done, but this was a Naval Aviation Enterprise team success," Renn said. "An accomplishment of this magnitude speaks volumes about our ability to harness partnerships and overcome complex obstacles to meet or exceed fleet demand."

U.S. Navy Photos by Toiete Jackson

Aircraft Mechanic Michael Pucket installs a fan geometry actuator on an F414 engine.

The Rise of Cold Spray Technology at Fleet Readiness Center Southwest

In the realm of Naval Aviation maintenance, repair and overhaul, a transformative technology is taking flight. At the heart of this revolution is Fleet Readiness Center Southwest (FRCSW), where a team of dedicated engineers is pioneering the use of cold spray technology. This innovative approach is not only enhancing the repair capability for aging aircraft but also paving the way for substantial cost savings, an increase in readiness and environmental benefits.

Luc Doan, a Senior Materials Engineer with nearly three decades at FRCSW, alongside fellow F/A-18 Senior Engineer Conrad Macy, and Materials Engineers Stoney Middleton and Matthew Chu, spearheaded this initiative. Cold spray, a subset of thermal spray technologies, stands out for its unique method of depositing metallic powder. Unlike other thermal techniques that rely on heating the powder to its melting point, cold spray propels the metal powder at high velocities, creating a solid-state process without the need for melting. This technique creates a metallurgical bond with the substrate, resulting in a robust and durable repair. What distinguishes FRCSW in this field is not just the technology itself but also the scale and sophistication of its implementation. The Materials Engineering Department boasts an array of cold spray and ancillary equipment, including multiple low-pressure cold spray systems manufactured by Centerline and Inovati as well as a high-pressure VRC cold spray system, recently added to FRCSW's repair toolbox. These systems are capable of both hand-held and robotic spray operations. Hand-held spraying accounts for over half of their repairs. This capability has led to more than 35 approved repairs and the restoration of 400 parts, a testament to the technology's growing significance in maintaining and extending the life of naval aircraft. None of the Cold Spray repaired parts has returned to the depot because the repair failed in service, a sign the technology is working.

Introduced to FRCSW in 2009, cold spray technology was initially used in partnership with original equipment manufacturers, academia and other partners. Macy, a Fleet Support Team Engineer known for his innovative and passionate approach, was instrumental in recognizing the potential of the Cold Spray technology to repair corrosion and wear damage. He implemented it

to repair the low in-supply, long lead-time, and high-value F/A-18 Aircraft Mounted Auxiliary Drive (AMAD) gearboxes. A year later, the first NAVAIR cold spray repair was approved for the Super Hornet AMAD Hydraulic Pad with fretting damage. The first AMAD was repaired and returned to the supply system in February 2011 and installed on a Super Hornet in May 2011. To date, 35 AMADs have been repaired by cold spray, comprising an asset that has over 24,500 flight hours as of May 2023.

The success of cold spray hinges on the skilled artisans who undergo rigorous training and certification to master this technique. A Job Qualification Requirement (JQR) was established in 2020 that contains classroom and on-the-job trainings for cold spray artisan certification. The benefits of cold spray extend beyond the technical prowess it provides. It represents a shift in maintenance philosophy, moving away from traditional methods like adhesives, sealants, and paints for blend-and-fill repairs. These hazardous materials are less corrosion and wear resistant, and pose environmental risks as well as risks to human exposure. Cold spray, with its metallic composition, offers high adhesion strength (over 5,000 PSI) and plays a crucial role in corrosion mitigation, a critical aspect of aircraft maintenance, repair and overhaul.

Financially, the impact of cold spray at FRCSW is profound. With more than 35 approved repairs across various platforms like the F/A-18A-F Hornet, EA-18G Growler, MV-22 Osprey, E-2C/D Hawkeye, C-2A Greyhound, AH/UH-1 Viper/Venom and CH-53 Seahawk, the technology has led to significant cost savings and avoidance. These repairs range from individual components to on-aircraft repairs. For instance, the repair of the F/A-18 APG-73 Radar Rack aft bulkheads alone saved millions of dollars. To date, FRCSW has repaired 51 aft bulkheads with another six aft bulkheads scheduled to be repaired in FY24. A stark contrast to the high costs and long lead-times associated with procuring new parts. Additionally, the F/A-18 AMAD gearbox and associated repairs have saved multiple millions of dollars and prevented fleet supply shortfalls because of lengthy lead times for new gearbox castings. Another example is the on-aircraft repairs performed in the last 10 months. The cold spray technology also repaired a CH-53 for corrosion damage, four E-2Ds for gouge damage, and five UH-1Y for corrosion damage at Camp Pendleton, California.

As FRCSW continues to increase and expand its cold spray capabilities, the implications for Naval Aviation maintenance are clear: innovative advancement for the fleet, unmatched efficiency, significant cost savings, and corrosion threat reduction all while reducing environmental impact and increasing readiness. Most recently, the FRCSW Cold Spray Team presented their latest approved repair, spray brushing to repair damaged wheel bores on the F/A-18E/F main landing gear wheel, at the 2023 Maintenance Innovation Challenge in San Diego, California, on Dec. 18, 2023.

U.S. Navy photo by Janina Lamoglia

FRCSW Materials Engineer Stoney Middleton demonstrates cold spray technology.

FRCE Materials Engineering Division Boosts Aircraft Performance, Efficiency, Safety

For those working in Fleet Readiness Center East's (FRCE) Materials Engineering Division, the answers to complex questions can often be found by focusing on the smallest of details. Analysis of a microscopic fracture or the precise identification of a material's elemental components can lead to enhanced aircraft performance, efficiency and safety that benefit the entire fleet.

The division consists of approximately 36 personnel who provide crucial maintenance, engineering and logistics support for a wide array of military aircraft. The team of materials and chemical engineers, chemists and technicians utilize state of the art laboratory equipment to perform research, testing and evaluation activities as well as to develop and continually improve the processes in use within FRCE.

"We support all the industrial processes in the depot," said FRCE Materials Engineering Division Head Robbie Mehring. "We provide lab services that verify materials and processes used in the shops. For example, chemical processing tanks, structural adhesives and metals used for manufacturing critical components are tested here. The lab helps to ensure that we're putting together a good product for the fleet."

According to Kevin Aycock, a materials engineer, the team's efforts are instrumental to the development and validation of maintenance, repair and inspection processes at FRCE as well as the establishment of new capabilities at the depot.

"If the depot is trying to establish a new capability or develop a process, we'll provide our expertise," Aycock said. "Because of our testing capabilities here in the lab, we also play an important role in identifying new technologies to bring here."

The division works closely with FRCE artisans and the depot's Fleet Support Team (FST), groups of experts who routinely deploy to the fleet to collect data, provide consultation and training, and perform on-the-spot troubleshooting and repair. The division also collaborates with military aviation units as well as original equipment manufacturers.

"The thing I like the most is that we get something new every day," said Latane Mason, a materials engineer. "This can also be very challenging. Since we support the FST and the depot, we get all the different aircraft, the various systems found on these aircraft and all the depot processes. We may work on electronics one day and hydraulics the next day."

The division supports aircraft found throughout the U.S. military, including legacy platforms that have been in service for decades. According to Aycock, this presents unique challenges often involving components no longer produced by the manufacturer.

"We assist in identifying a substitute or producing a product that's either the same or better quality as the original design," Aycock said. "It's challenging but I take a lot of pride in this. We're manufacturing high quality parts and meeting modern requirements using a drawing that is 50 years old."

According to Mason, military aircraft often operate in environments that pose challenges the team must contend.

"The maritime environment is harsh on all materials," Mason said. "Polymers may not corrode, but they can degrade over time. Water can be an issue, especially with the moving parts we have on aircraft. You get water trapped somewhere and it can start to develop high concentrations of corrosive ions."

In order to perform realistic testing that mimics these conditions, Mehring said the lab is equipped to replicate environmental conditions aircraft in the fleet encounter.

"We have salt-fog chambers here to do comparative corrosion testing," Mehring said. "For example, if there's a newly devel-

U.S. Navy photos by Joe Andes

Latane Mason, a materials engineer at FRCE Materials Engineering Division, tests a piece of metal using a macro hardness tester.

Latane Mason, a materials engineer at FRCE Materials Engineering Division, examines a fractured surface using a stereo microscope.

oped paint, we can compare it against the legacy paint and see how each holds up. It gives us confidence that a new material will be at least as good, if not better, than the legacy material."

Testing and analyzing the corrosion and wear of materials is just one of the many processes performed in the lab.

Mason, who performs failure analysis, said materials and components are run through an exhaustive process when they arrive. Because failure analysis often requires cutting the item for analysis, he stressed the importance of photo documentation in his work.

"When we perform the analysis, we want to know exactly how the item came in because we are going to change it throughout our process," Mason said. "We cut things and take them apart so it is extremely useful to have that original state captured in photos."

According to Mason, capturing the original state of a part or component involves macro photography performed with a handheld digital camera. Once the item is cut down into a smaller piece, it is can be magnified using a scanning electron microscope.

"At this point, we're seeing things at up to 250,000 times magnification," Mason said. "We've moved beyond documentation and we're now analyzing specific features. We can identify things such as the origin or mechanism of a fracture or corrosion. We look for the things the systems engineers need to know so that they can work towards a corrective action."

In addition to high-powered microscopes, the lab is equipped with a vast array of highly specialized equipment used to analyze the chemical and mechanical properties of materials. Mehring said these sophisticated tools provide the team with the data necessary to fully analyze, test and evaluate materials.

"We have various equipment that can identify the elemental composition of metals or evaluate the properties of different polymers and coatings," Mehring said. "We have lab areas dedicated to chemical and analytical analysis, oil analysis, metallurgy, polymers and corrosion. We also have the experts who know how to run these machines and get the maximum out of them."

Lab staff also employ a variety of nondestructive testing methods on materials and components said Mehring.

"Our nondestructive inspection team works to develop methods and procedures that can be executed in the fleet or here on site," Mehring said. "It's crucial work that can identify potential issues. This work is vital in the development of how inspections are conducted and written into instructions."

The team also plays an important role in the development and review of manuals and repair procedures. Aycock said the team works closely with FST engineers to conduct materials engineering reviews which are crucial when writing or updating repair manuals.

"Our subject matter experts review all of those manuals for their applicable process," Aycock said. "We're making an impact that benefits the entire Navy when it comes to developing repair procedures."

Mehring cited the close working relationship his team enjoys with departments throughout FRCE as well as partners outside of the depot as instrumental to the division's success.

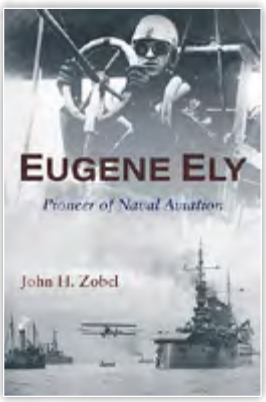
"We don't do anything in a vacuum," Mehring said. "We work closely with our customers and almost every department here at the depot. There's a lot of interaction, communication and collaboration that goes on behind the scenes."

While the Materials Engineering Division is involved in wide a range of projects, Mehring said that the focus is always on providing capable, high quality aircraft to the warfighter.

"The cool part of the job for me is knowing the impact my team has on the fleet," Mehring said. "They are enhancing and ensuring the safety and performance of our aircraft. They support standing up new capabilities important to the future of the depot and the Navy. Whether in those capacities or running an urgent analysis to get an aircraft back up in the air, it's an honor knowing that we have supported these efforts."

Professional Reading

By Cmdr. Peter B. Mersky, USNR (Ret.)



Eugene Ely: Pioneer of Naval Aviation

By John H. Zobel

Naval Institute Press, Annapolis, Md. 2023. 345 pp.

As many historians, other writers and authorities will tell you, it is well to learn about where you come from, whatever society or profession. Most of us who spent their careers around naval aircraft or aircraft carriers have heard occasional mention of Eugene Ely (pronounced E-lie, as in "lie on the bed") and/or his epic flights from or to a makeshift deck aboard a ship in 1910 and 1911. But usually that knowledge is as far as it goes. However, there was so much more to this well-travelled man from Iowa whose life spanned less than 30 years but whose "impact" had on a group of people, in this case military forces, or more specifically, seaborne forces, which we all know so well. Indeed, his story was much more than we made of it in all the years preceding the book's publication.

Throughout all of the early text, an underlying theme had been Ely's search for a sustained supporter to resupply him with dependable aircraft. By 1910, he was with Glenn Curtiss, who had always been in great competition with other early aviators, especially the Wright Brothers, who, of course, had made the first controlled flight of a manned aircraft on Dec. 17, 1903.

The early narrative works its way up to those memorable flights he made in November 1910 and January 1911, launching from and landing aboard two different Navy ships, thereby becoming what he is most remembered for—the beginning of Naval Aviation as we know it today, more than a century later. Ely was a brave and innovative young American, who took to the many facets of what this country, indeed, the rest of the world, was becoming, mainly an already industrialized group of nations that were looking into the future with automobiles, ships and now aircraft offering heretofore unprov-

Photo courtesy of Peter B. Mersky

A commemorative sign on Virginia State Route 60 Eastbound outside Naval Air Station Norfolk, Va., just before the Hampton Roads Tunnel describes Ely's flight from the scout cruiser USS Birmingham (CV 2) on Nov. 14, 1910.

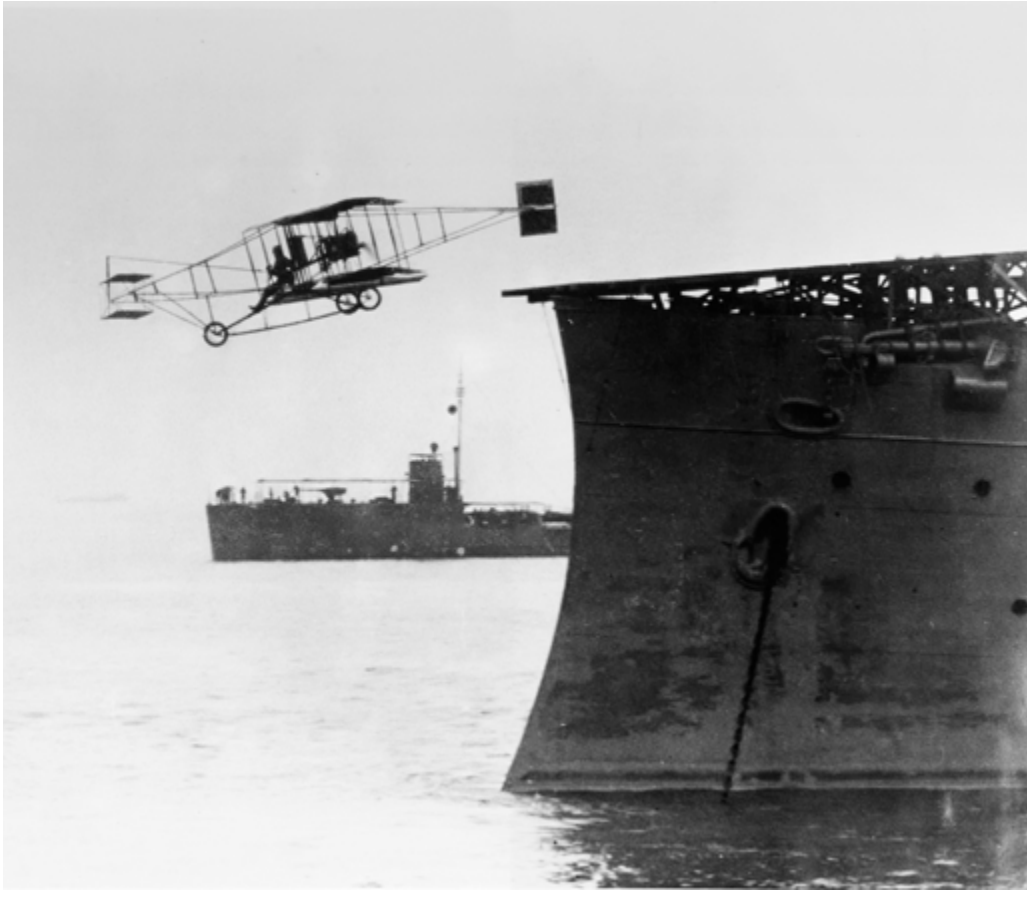


Photo courtesy of Naval History and Heritage Command (NHHC)

Showing the first launch, i.e., takeoff, from a ship, Ely leaves the flight deck from the USS Birmingham on Nov. 14, 1910.

Photo courtesy of NHHC

Now, on Jan. 18, 1911, Ely reverses the direction and is about "land," the term would later become "trap," aboard the armored cruiser USS Pennsylvania (ACR 4), using sandbags and guide rails instead of modern cables and a tailhook, extended below the aft section of the aircraft, and this time on the other side of the country in San Francisco Bay.

en modes of not only transportation, but also, sadly, new ways of making war.

This book by an author, who unfortunately died before the book was published, is, to my knowledge, the first book-length biography of Eugene Ely. It uses rare first-person accounts, family papers and other primary sources to describe this highly capable young man, who was an accomplished automobile driver and motorcycle racer before he ever saw an aircraft, and how he became what was at that time arguably the most experienced pilot of early aircraft, which were flimsy, canvas-and-wood affairs that were difficult to fly, and even remain alive while doing it.

There are familiar names, such as Curtiss and Wright, and other not-so-familiar names like Grahame-White (an exhibition aviator from England) and Sopwith (whose name will be forever associated with his Camel fighter of WWI), who nevertheless contributed so much to the development of aviation in the first two decades of the 20th century. The book also includes intimate descriptions of the unique, but often highly dangerous contraptions loosely referred to as aircraft, which we today 100 years later would scarcely recognize as being the ancestors of the Fokker D.7, P-51 Mustang, F-86 Sabre, the F-8 Crusader or the F-4 Phantom, F-16 Fighting Falcon, or any number of post-Vietnam first-line fighters, not to mention other groups of bombers, even airliners or other specialized aircraft, or those "aircraft" we have sent into earth orbit or to the moon. But these man-crafted, man-inspired vehicles came from the first designs that men like Eugene flew in dangerous, and often fatal circumstances and are definitely at the roots of the family trees of aircraft we now take for granted.

Beginning with a detailed, evocative view of late 19th century America as it prepared to enter the next century filled with so much promise and exciting future, especially the April 1906 destruc-

Photo courtesy of NHHC

Following his landing on the Pennsylvania, Ely prepares to launch from the ship on Jan. 18, 1911. Note his improvised flight gear of a football helmet and inner tube flotation devices around his upper body.

Photo courtesy of NHHC

Ely leaves the stern deck of the Pennsylvania just after landing aboard the ship on Jan. 18, 1911. Note the direction of the ship's smoke indicating the crosswind at the time.

tive earthquake in San Francisco, the narrative describes Ely's appearance and highly involved career with the beginning of the automobile.

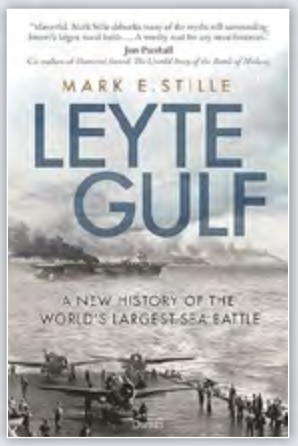
As the book progresses, we learn just how much experience, how much actual flying time he had in the many meets and air shows held before his iconic flights from and to U.S. Navy ships he made that would soon change naval warfare so drastically. Indeed, Ely's story was much more than we have made it in all the years preceding this book's publication.

The book's narrative is fascinating as it works its way up to the meeting between U.S. Navy Capt. Washington Irving Chambers, charged with developing the Navy's growing interest in aviation, at an air show at Belmont, New York, in 1910, where the captain enlists the young aviator's help in perhaps demonstrating how an aircraft of the time might be flown from a ship. The flights from and to different ships were successful, if somewhat tentative when compared with how such operation became more than possibilities during WWII, Korea, Vietnam, and certainly in today's Navy aviation. One little-known person in the story is Ely's young, attractive wife Mabel and the part she played in telling her husband's story.

The buildup to Ely's epic launch (takeoff) from one ship in November 1910, and, later, his recovery aboard another ship in January 1911, is filled with competition with other companies. At the time, Ely was an employee of the Glenn Curtiss company, appearing in various air shows around the U.S., a little-understood activity of the period, just as active as the more famous barn-storming activities of air circuses and solo performances by the colorful barnstormer pilots of the 1920s and 1930s shown in such movies as "Waldo Pepper" starring Robert Redford and "The Spirit of St. Louis" starring Jimmy Stewart, himself a highly-experienced pilot who flew B-24 Liberator bombers during WWII. I was surprised at how much was there that I never knew. It's worthy of a Hollywood biopic as well as recreating the period and the flimsy aircraft that were so much a part of it and the lives of the early aviators who challenged the new art of flight.

The story of what would become Eugene Ely's acts of flying from and to a ship in 1910 and 1911, respectively, began in early 1910 as Chambers took notice of the young flier at air shows as the Navy began to consider military uses of the growing interest around the world of the new air vehicle. The accounts of these events are surprisingly brief, but the details of the troubles of first placing him and his Curtiss pusher on the small platform and his departure and hazardous flight—quoting author John Zobel, "It is impossible to overstate Ely's courage in attempting the flight" and frankly, it holds true even today a century later for his professional descendants—and finally finding a reasonable landing spot on the shore of Willoughby Spit where stands a small but durable commemorative sign today on eastbound Virgina Route 60 must surely rank as one of the great historical achievements of the new 20th Century.

What is known in the popular history of Eugene Ely and his two pioneering flights that began what we know today as the beginning of Naval Aviation is almost hidden by the book's detailed account of all that went before them. However, John Zobel's detailed research definitely shows that Ely was much more than a two-event thrill-seeker out to play with the world's new toys. He was a goal-oriented individual who saw the airplane as a major part of what was coming in the new century, and he was bound to be part of it, indeed, even one of the main drivers of this history that would definitely change the world in so many ways, in so many arenas, in war and peace. Unfortunately, as it would happen, and this new biography would go on to tell, he would not be alive to see these new, incredible events in the very near future.



Leyte Gulf: A New History of the World's Largest Sea Battle

By Mark E. Stille

Osprey Publishing, Oxford, UK. 2023. 320 pp.

Of all the history of World Pacific War, the approximately two weeks of October 1944, involving Japan's last and most bloody strategic attempt to regain its massive momentum of the first two-and-a-half years and that of the U.S.-led Allied originally desperate attempt to stop Japan's rule of the western and southern Pacific, and especially to retake the Philippines, the Battle of Leyte Gulf, has taken more research, resulting in more pages in magazines and books than any other operation of World War II.

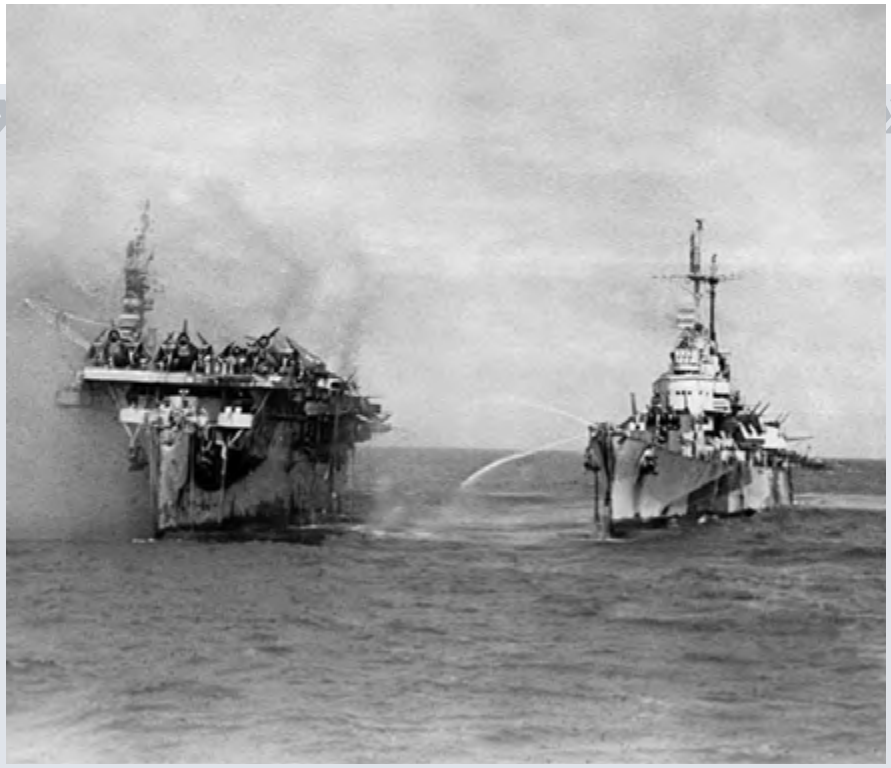
Indeed, this book's author has now written two campaign series titles in Osprey's catalog, as well as still yet another soft-cover title (Campaign No. 399), Philippines Naval Campaign 1944-45: The Battles After Leyte Gulf. And finally, this hard-cover book. Add to all this highly-researched production yet a single Osprey soft-cover book on the ground war, Leyte 1944: Return to the Philippines by U.S. Air Force veteran and Ph.D., Clayton Chun, and you have a veritable multi-volume modern encyclopedia of the struggle to kick the Japanese out of the Philippine archipelago, as well as perhaps to return the Army's five-star Gen. Douglas Macarthur to his pre-war throne. After all, with Macarthur's pressure to overcome Navy Admiral Chester Nimitz's desire to press on to Japan's home Islands for at least the last year of the war,

Stille now approaches the same subject to bring it all together with new in-depth research and analysis in a single hard-bound volume. He has set himself a very hard task, but he is up to it.

At first, he begins with a very workmanlike history of the Pacific war's preceding years bringing Japan's distinct military and political stories together to establish the nearly monolithic presence in the

Photo courtesy of NHHC

Lt. Charles Skinner (center). CO of VB-13 aboard the USS Franklin (CV 13), describes his squadron's attack on the enemy fleet in the Sibuyan Sea on Oct. 24, 1944.



Photos courtesy of NHHC

The light cruiser USS Birmingham (CL 62) (right) comes alongside the burning light carrier USS Princeton (CVL 23) (left) to assist fighting fires aboard the carrier.

A veteran of the Coral Sea in May 1942 as well as the Battle of Midway the following June, the Japanese light carrier Zuiho remains underway after taking several hits by aircraft from Task Force 38 during the battle off Cape Engano on Oct. 25, 1944. This photo was taken from an aircraft from the USS Enterprise (CV 6), herself a survivor of Japanese air attack off Guadalcanal. The photo shows the carrier's flight-deck camouflage, men on the deck, which has buckled amidships, and the mast now horizontal with the Japanese naval ensign at its tip. The Zuiho sank that afternoon.

Pacific that almost accomplished Tokyo's vision of "Asia for the Asians."

This single-mindedness of purpose is almost graphically illustrated in every history of the first half of the 20th century east of Hawaii. Consider any folio of photos that accompanies each tome put out by many publishers. Photos of Allied leaders abound with groups of these senior officers struggling to plan their route to the victory they eventually attain. It's usually President Roosevelt with two of the war's most identifiable military competitors—Admiral Nimitz and General Macarthur, normally at each other's throats vying for the president's attention and support for their widely differing interpretations of the current situation and individual programs of how to fight the war. Yet, in every account of their enemy's conduct of their war, each Japanese admiral and general is shown alone, in full-dress uniforms and medals, seriously posing for an official portrait, but seldom with the ship and aircraft crews fighting his war.

Leaving the introduction, the author gets into a very serious discussion of the major leaders of the coming engagement. Mired in heavy details that often get perhaps too much for me, frankly, these weighty facts, figures and other aspects get in the way of the overall story of any such historical accounts. The young men on both sides fight to not only destroy targets but simply stay alive.

We eventually get to the units that made up the battle on either side and their equipment beginning with the aircraft involved, with the Grumman F6F Hellcat leading the way, perhaps one of the most naval tractable aircraft of the Pacific war, possessing the combination of maneuverability, armament, speed and ruggedness that made it the victor over the veteran Zero, but still the main fighter of the Imperial Navy since before Pearl Harbor three years earlier and many thousands of miles across the Pacific.

The Japanese Navy was severely hampered by a lack of underway refueling and supply capability, while the U.S. Navy had been developing this vitally important capability for a long time. Japanese logistical support for its aircraft was also inferior. All of which contributed to their inferiority for the coming showdown with the Allied forces during what they called Operation Sho-Go (Victory Plan).

After detailing the setup and preliminary skirmishes, the author gives a barely readable though still

Before launching on a search mission on Oct. 25, 1944, SB2C Helldiver dive bombers are loaded with drop tanks aboard the USS Lexington (CV 16). The original Lexington (CV 2) was sunk at the Battle of the Coral Sea on May 8, 1942.

very important account of the first major encounters in the Sibuyan Sea north of the island of Panay, where Japanese carriers and fleet ships like the monster battleship Musashi one of two huge BBs, (the other being the Yamato) the world largest and most heavily-armed battleships, fought it out against squadrons of Grumman Avenger torpedo bombers and Curtiss Helldivers, successors to the Douglas SBD Dauntless dive bombers that kept the Imperial ships at bay in the first year of the Pacific war. The U.S. Navy suffered important losses.

The key to understanding this book is Chapter 8: Why combat-experienced Japanese Vice Adm. Kurita Takeo broke off the battle and turned for home, right at the time he had the advantage over the still-strong and nearby American fleet. Kurita did not want to have his forces die in a meaningless death in a final useless engagement contesting the enemy fleet and especially its seemingly uncontrollable carrier airpower and the presence of so many destroyers and cruisers. (Kurita now commanded the Mobile Force's First Diversionary Attack Force, arguably the most-powerful sub-force in the Japanese line-up. It had no carriers, but among its complement, counted three battleships [among them, the Musashi and Yamato, the world's largest and most heavily armed BBs] and six heavy cruisers, a light cruiser, and no less than nine destroyers.)

This chapter puts a human face on a Japanese admiral struggling with how to decide what his next moves should be as he also decides whether to continue the fight against the Allied surface forces arrayed against him and his dwindling assets, or strike out back to Japan and home, which is what he actually decided to do.

There was also the introduction on Oct. 25, the first organized kamikaze suicide attacks, a very surprising and personal weapon that remained for the next 15 months of the Pacific war. Kamikazes were so much against western understanding that Allied sailors in the ships that were attacked and occasionally sunk by the enemy planes that were now being used in this terrible fashion could never truly understand this drastic development.

Stille's ability to keep data organized in this lengthy account of what was undoubtedly the greatest naval battle of the 20th century, putting it on a par with the Battle of Midway in June 1942, places this new book and new assessment of Leyte far beyond what I have seen.

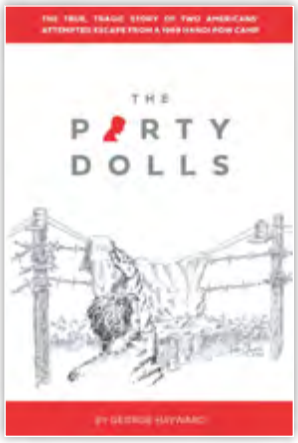
Aboard the USS Lexington, deck crewmen help lift the wounded pilot from his F6F-5 Hellcat after he returned from a strike against the Japanese fleet on Oct. 25, 1944, during the Battle of Leyte Gulf.

Editor's Choice

As Naval Aviation News enters its 108th year of publication, we've added a new section to the magazine, "Editor's Choice." In it, guest writers will review new or recent volumes with applications of particular interest to Naval Aviation.

This issue's inaugural review looks at the award-winning book "Party Dolls," a recounting of a failed escape from a Hanoi prisoner of war camp in the Vietnam War. Winner of Best Indie Book (Nonfiction Military History) in 2021, and Independent Press Award (Military Nonfiction in 2022), the volume focuses on captives of two nine-person cells, their relationships, conflicts, and the ill-fated decision—or acquiescence—to support an escape that no one, perhaps save one, believed could succeed. It's a book that does not focus on leadership, yet at its core is all about leadership.

—David Byrd, Editor in Chief



The Party Dolls: The True, Tragic Story of Two Americans' Attempted Escape from a 1969 Hanoi POW Camp

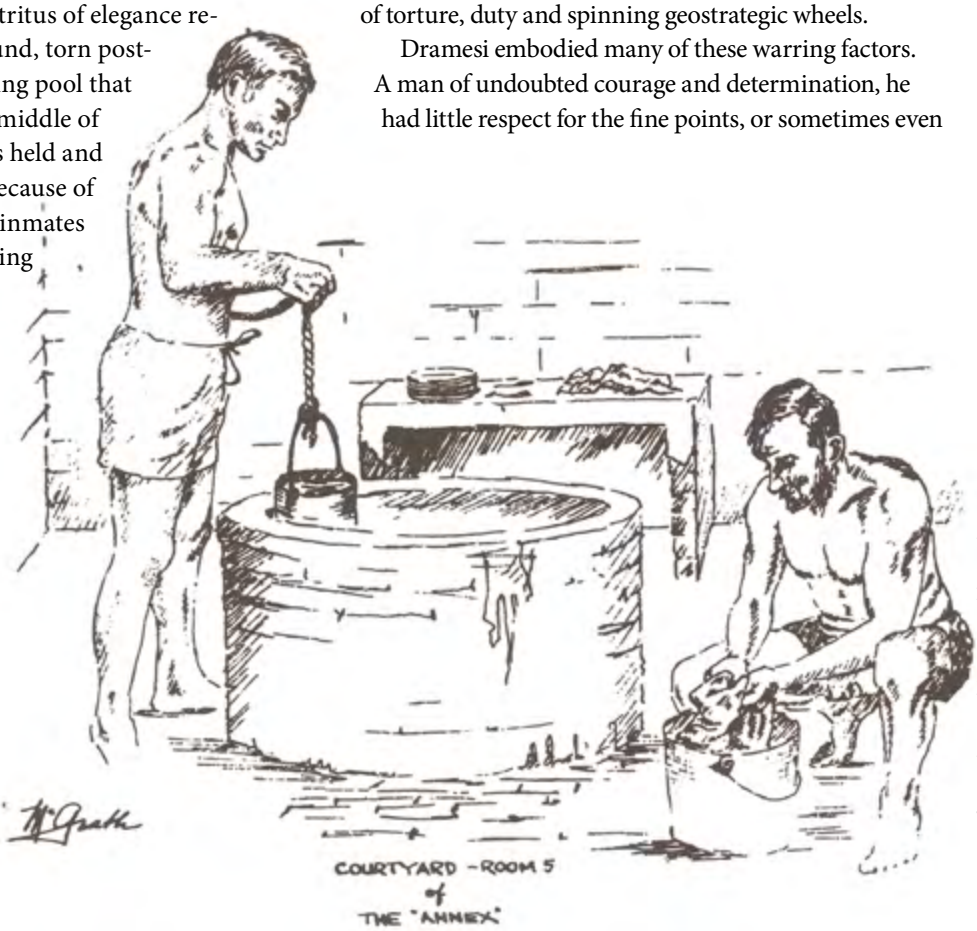
By George Hayward. Independent publishing. Monee, Ill. 2021. 171 pp.

Review by Robert Oliver

It was a factory of dreams that became an oubliette of pain. The Cu Loc Prison Camp in the southwest region of Hanoi, some 4 miles west of the Red River, had been built as a movie studio during the French colonial period, and even after it was converted to a prison during the Vietnam War, the detritus of elegance remained. Old movie cans littered the ground, torn posters covered the walls and a large swimming pool that had turned into a cesspit dominated the middle of the compound. To the American aviators held and tortured there it was the Zoo, so called because of the North Vietnamese habit of parading inmates for propaganda purposes, and the adjoining walled area that had once been a warehouse compound was known as the Annex. By 1968, the Annex held over a hundred allied prisoners, mainly American airmen of the rank of Air Force captain or Navy lieutenant, crammed into poorly ventilated cells holding nine poorly fed, poorly treated, undernourished, but determined captives.

George Hayward's book "The Party Dolls" tells the story of an attempted breakout (the "party" of the title) from the Annex in 1969, an endeavor centered on inmates of Room 6 and their ostensible senior-ranking officer (SRO), Air Force Capt. John A. Dramesi. Hayward's prose is quasi-journalistic, more in the tradition of court testimony than James Clavell. But his spare writing fits the story of ordinary Americans united by horrific circumstances and stoic bravery while split by rank, service, personality and background, all against a murky backdrop of torture, duty and spinning geostrategic wheels.

Dramesi embodied many of these warring factors. A man of undoubted courage and determination, he had little respect for the fine points, or sometimes even



Lt. Mike McGrath, shot down in his A4C Skyhawk on June 30, 1967—his 179th mission—drew a series of images after his release to depict life in Cu Loc, colloquially known as the "Zoo Annex." Here, the daily courtyard break, usually 20 minutes or less, is shown. McGrath was held in a cell adjacent to "The Party Dolls."

Image courtesy of Capt. Mike McGrath (USN, ret.) and the Naval Institute Press

Image courtesy of Capt. Mike McGrath (USN, ret.) and the Naval Institute Press

Navy Lt. (later, Captain) Mike McGrath annotated this map shortly after his release from a Hanoi prison camp in 1973. McGrath was in Cu Loc (lower left), dubbed the Zoo Annex by the prisoners, in the cell next to where Dramesi and Atterberry planned and later executed their escape.

the basic points, of military tradition. Having a reputation for completing required training more through gall and defiance than skill, he had seized the SRO position in Room 6 from a longer-tenured captain on the basis of what was at best a technicality, and pushed his escape plan in the face of standing orders and military doctrine, even going so far as to place himself at the center of planning and execution, a role generally delegated to someone other than an SRO, who bore the greater responsibility for all the men placed under him by circumstance.

Dramesi undertook the escape himself, becoming one of the "Party Dolls" of the title. The other was Air Force Capt. Edwin "Ed" Atterberry, an RF-4 reconnaissance pilot with an amiable manner but a cypher-like relationship to his cell mates, a combination perhaps befitting his status as an intelligence asset. The escape, the so-called "Party," failed miserably due to poor planning, lack of knowledge of the surrounding terrain and sheer foolhardiness. The result was Atterberry's death, the brutal torture of the Annex prisoners and darkening of Dramesi's reputation for the remainder of his life.

Hayward's style is straightforward, the discussion not especially erudite, and some of the facts themselves have been recounted elsewhere. But the author's direct, clear style powerfully conveys the cruelty and complexity of the situation these POW's experienced, as well as the tragedy that befell them. In that, it is a worthy chronicle, for what human institution is more complex, more cruel or more tragic than war?

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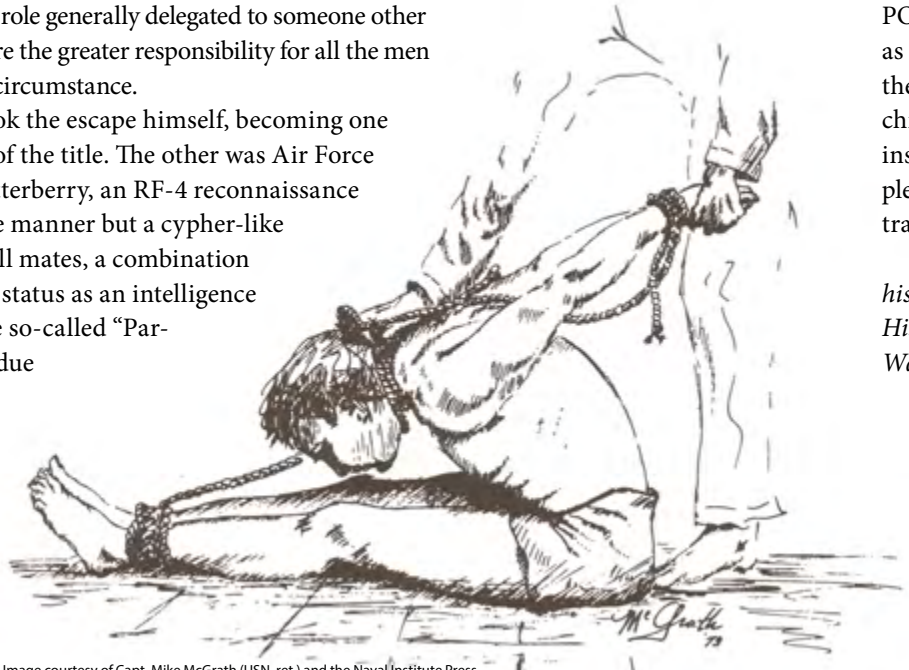

Image courtesy of Capt. Mike McGrath (USN, ret.) and the Naval Institute Press

"The ropes," the oft-used and one of the most feared torture techniques used on all Allied prisoners of war.

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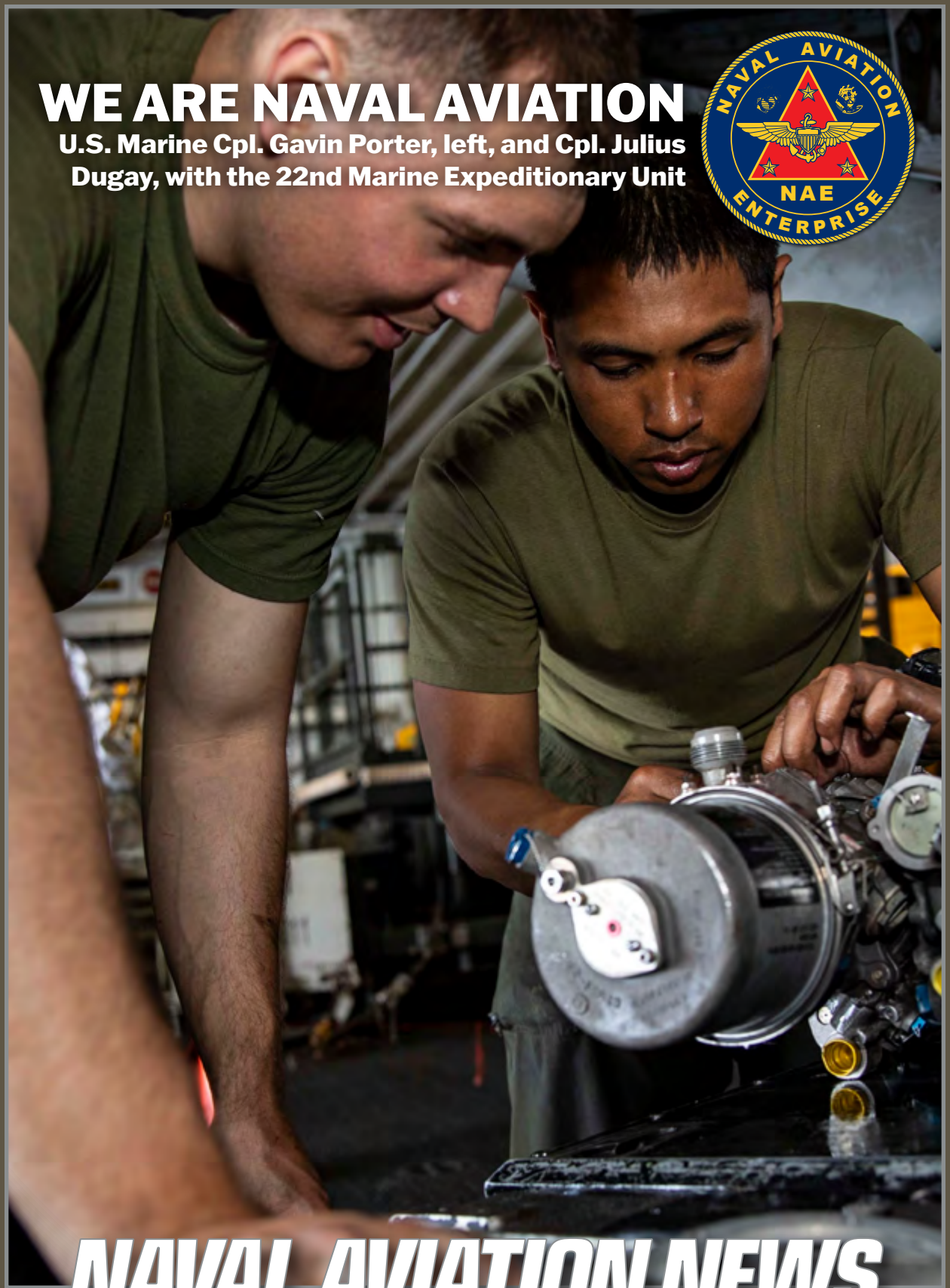
U.S. Marine Cpl. Gavin Porter, left, and Cpl. Julius Dugay, with the 22nd Marine Expeditionary Unit



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