

Super Blue

Tricked and Flipped Out

First F/A-18E Modified, Tested, Ready for Blue Angels

WHAT'S INSIDE

- ▶ Physiological Episodes: CNAF 3710 Updated
- ▶ Vinson: Flight Deck Cert with first F-35Cs
- ▶ USNTPS Opens Doors for NFOs



An F/A-18E Super Hornet, attached to the "Rampagers" of Strike Fighter Squadron (VFA) 83, takes off from the flight deck aboard Nimitz-class aircraft carrier USS Dwight D. Eisenhower (CVN 69).

U.S. Navy photo by MCSN Jacob Hilgendorf

NAVAL AVIATION NEWS

FALL 2020

VOLUME 102, No. 4

DEPARTMENTS

- 4 Flightline
- 7 Grampaw Pettibone
- 8 Airscoop

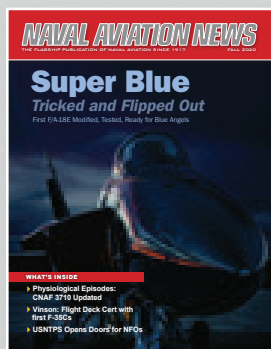
FEATURE

- 24 **Ford Welcomes Carrier Air Wing 8, Hits 4,000th Launch and Recovery**
- 28 **Super Blue: Tricked and Flipped Out**
First F/A-18E Modified, Tested, Ready for Blue Angels
- 36 **Vinson Conducts Flight Deck Cert with First Operational F-35C Squadron**
- 40 **New Operating Procedures to Mitigate Physiological Episodes**
- 42 **Fleet Readiness Center East Produces Critical V-22 Components**
- 44 **CH-53K Integrated Test Team Stretches King Stallion's Sea Legs**
- 46 **NAWCWD, Amyris Collaborate on High-Energy Biosynthetic Fuel**
- 48 **U.S. Marine RQ-21 Takes First Australian Flight**
- 50 **Test Pilot School Opens Doors for Naval Flight Officers**

ALSO IN THIS ISSUE

- 53 Professional Reading
- Inside Back Cover Squadron Spotlight

ON THE COVER



On the cover: The first Blue Angels F/A-18 Super Hornet parks on the flight line at Naval Air Station Pensacola, Fla. The "Super Blue" has undergone several modifications to both its look and mechanics, including the Blue Angels' trademark paint scheme and fuel-delivery system, on its way to being prepped for upcoming air shows, the details of which begin on page 28. (U.S. Navy photo illustration by Fred Flerlage; photographic image by MC2 Cody Hendrix)

In this edition of Naval Aviation News, we highlight several technological advances and upgrades to existing aircraft and carriers despite the ongoing challenges presented to our fleet due to the COVID-19 pandemic. On page 24, USS Gerald R. Ford (CVN 78) marked its 4,000th catapult launch/arrested landing and welcomed its dedicated air wing while undergoing its latest steam trial in the Atlantic Ocean. In our continuing coverage of the U.S. Navy's investigation into and prevention of physiological episodes, we highlight the latest changes to the Naval Aviation operating instruction on page 40. And on page 44, the CH-53K King Stallion was put through sea paces with the assistance of the Air Test and Evaluation Squadron (HX) 21 and the crew of USS Wasp (LHD 1).

On the back cover: Airman Brianey Casillas, left, and Aviation Boatswain's Mate (Equipment) Airman Nathan Peterson hook up an F/A-18E Super Hornet, attached to the "Dambusters" of Strike Fighter Squadron (VFA) 195, to a catapult on the flight deck of aircraft carrier USS Ronald Reagan (CVN 76). (U.S. Navy photo by MC2 Samantha Jetzer)

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

Director, Air Warfare

Rear Adm. Gregory N. Harris, USN

Editor in Chief

Andrea Watters, Naval Air Systems Command

Editorial Board

Stan Coerr, Headquarters, Marine Corps

Marcia Hart, Naval Air Systems Command

Richard Holcomb, Air Warfare N98

FORCM Huben Phillips, USN, Naval Air Force, Atlantic

Naval Aviation News Staff

Fred Flerlage, Art Director, Naval Air Systems Command

Rob Perry, Staff Writer/Editor, Naval Air Systems Command

Contributing Editors

Emily Funderburk, Naval Air Systems Command

Melissa A. Johnson, Naval Air Systems Command

Paul Lagasse, Naval Air Warfare Center Aircraft Division

Columnists

Cmdr. Peter Mersky, USNR (Ret.), Book Review Editor

Cmdr. Bryan Dickerson, USN (Ret.), Contributing Editor

Submission Guidelines

Commands may send news and announcements such as awards, rescues, milestones and other achievements to nannews@navy.mil. 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 nannews@navy.mil or 301-342-6024.

Personal Subscriptions and Address Changes

A one-year subscription (four issues) is \$23.00 domestic, \$32.00 overseas. For online orders go to bookstore.gpo.gov. For mail orders, cite *Naval Aviation News* and send check, money order, or credit card information to U.S. Government Printing Office Orders, P.O. Box 979050, St. Louis, MO 63197-9000. For fax orders, call 202-512-2104. For phone orders, call 202-512-1800, Mon-Fri, 0700-1830. For email orders, send to contactcenter@gpo.gov. For changes of address, also send to contactcenter@gpo.gov; include full name and both old and new addresses.

Official Subscriptions and Address Changes

Subscriptions to military and government agencies are provided free of charge through the Naval Aviation News office. Email nannews@navy.mil, send mail to *Naval Aviation News*, NAVAIR Public Affairs Office, 47123 Buse Road, Building 2272, Suite 346, Patuxent River, MD 20670 or call 301-342-6024.

Naval Aviation News (USPS 323-310; ISSN 0028-1417) is published quarterly for the Chief of Naval Operations by the Naval Air Systems Command. Periodicals postage is paid at Washington, D.C., and additional mailing offices.

The Secretary of the Navy has determined that this publication is necessary in the transaction of business required by law. The use of a name of any specific manufacturer, commercial product, commodity or service in this publication does not imply endorsement by the Navy. Any opinions herein are those of the authors, and do not necessarily represent the views of *Naval Aviation News*, the Department of the Navy or the Department of Defense.

Approved for public release: SPR No. 2020-831

Postmaster: Send address changes to *Naval Aviation News*, NAVAIR Public Affairs Office, 47123 Buse Road, Building 2272, Suite 346, Patuxent River, MD 20670.

NAVAL AVIATION NEWS IS ONLINE AT
<http://navalaviationnews.navylive.dodlive.mil>

SEND YOUR FEEDBACK TO: nannews@navy.mil

Flightline

Advancing Capability, Operational Readiness for Naval Aviation

By Rear Adm. John Lemmon, Commander,
Naval Air Warfare Center Aircraft Division

We operate under this mantra at the Naval Air Warfare Center Aircraft Division (NAWCAD): the acquisition and sustainment of capability is a weapon of war. As a combat support command, we conduct the research, development, test and evaluation, and life cycle sustainment for all of Naval Aviation. Our diverse command of talented military, civilian and contractor workforce advances capability and operational readiness for Naval Aviation every day. We bring our talent to bear on both fielded and not-yet-fielded Navy and Marine Corps platforms, systems and

Following the Naval Helicopter Association

symposium in May, Sailors with

HSC-2 in Norfolk had an opportunity

to try out the new seat,

which includes

improvements

such as height

adjustability, lumbar

support, adjustable

additional leg room,

the ability to recline, a

flip-up seat bottom,

redesigned restraints,

a redesigned headrest

to accommodate the

night-vision goggle

battery, and tracks

to allow the seat to

move to and from the

window.



U.S. Navy photo by Mikel Lauren Proulx



U.S. Navy photo by Erik Hildebrandt

A test pilot from Air Test & Evaluation Squadron (VX) 23 at Naval Air Station (NAS) Patuxent River, Md., conducts flight test in an F/A-18 over the eastern seaboard at sunrise.



U.S. Navy photo

Engineers at the Naval Air Warfare Center Aircraft Division's (NAWCAD) Atlantic Test Ranges monitor airspace over the Chesapeake Bay and other range assets during developmental flight testing.

technologies to revolutionize readiness and increase lethality.

Headquartered at Naval Air Station Patuxent River, Maryland, NAWCAD is one of two warfare centers supporting the Naval Air Systems Command (NAVAIR). With sites at St. Inigoes, Maryland; Lakehurst, New Jersey; and Orlando, Florida, NAWCAD is comprised of more than 10,000 aviators, engineers, scientists, logisticians, testers, artisans and other acquisition professionals.

We are the busiest flight test center in the world with a unique portfolio of more than 300 labs, test assets, a developmental test air wing and protected open air ranges with more than 27,000 square miles of air space over the Chesapeake Bay, and more than 50,000 square miles of air space over the Atlantic—all available to support anything from small unit-level events to large-scale joint exercises. Over a series of base realignments, NAWCAD became the Navy's largest warfare center by accumulating facilities

so advanced we have the organic capability to usher requirements and ideas from concept through development and then deployment completely in-house.

Engineering design? Let's get to work. Modeling and simulation? Coming right up. Prototyping and manufacturing? We've got it. Human systems research? Definitely—we provide the research, development, test and evaluation for everything that touches the human or that the human touches in Naval Aviation. Air vehicle modification? Yes again. We cut metal on aircraft to enable enhanced capabilities. Ready for ground and flight test? Our very own Naval Test Wing Atlantic has that covered—from fixed-wing, rotary-wing and even unmanned platforms of all sizes and types—our squadrons are ready to execute. For many projects, we also work directly with the fleet.

In addition to cradle-to-grave capability, NAWCAD provides training tools for Sailors and Marines at every stage of their career—including the next gen-

eration of test pilots coming out of our U.S. Naval Test Pilot School. And our highly patented workforce is world class in every discipline from biochemistry to human systems engineering to advanced undersea sensing. Collaborating both in and out of the DOD, we support technology advancement with industry, academia and other agencies. In fact, the Navy recently named NAWCAD leader of Southern Maryland's Tech Bridge charged with accelerating naval access to local innovation ecosystems and industry advancements by reducing barriers to non-traditional industry partners like small businesses, startups and nonprofits.

Solving Naval Aviation's Problems

I'll give one example of NAWCAD's problem-solving ability: our recent success supporting the Multi-Mission Helicopters program in redesigning, prototyping and manufacturing the MH-60's Next-Generation Gunner Seat.



A fuels and lubricants chemist at NAWCAD conducts jet and diesel fuel quality tests in a propulsion and power lab at NAS Patuxent River.

Not long ago, Naval Aviation named the MH-60 gunner seat the No. 2 safety priority because its configuration and ergonomics caused detrimental injury to fleet aircrew. The inflexible seat hindered the cabin mobility needed by gunners. Also, it was not adjustable for users of all

sizes, which degraded aircrew reach and visibility—our Sailors deserved better.

The warfare center went to work in collaboration with the Multi-Mission Helicopters and Aircrew Systems program offices. Our engineers coordinated directly with fleet gunners to understand

requirements for the new design. Our team modeled and simulated the new configuration digitally ahead of ground and flight test, saving time and money while fine-tuning first-article test assets. We brought the design to life by manufacturing the prototype right here at NAS Patuxent River. Leveraging years of flight and mishap data, the team conducted lab-based physical crash testing to ensure the new version was safe.

The new seat was integrated aboard an MH-60 at our very own rotary-wing Air Test and Evaluation Squadron (HX) 21 for ground and flight test. Following successful fleet fit checks, we facilitated the contract for full-rate production and fleet-wide retrofit—all of this in a single year from requirement identification. I am incredibly proud of the time and cost savings realized for the Navy, taxpayers and more importantly, the enhanced capability we provided the fleet—this is the kind of organic capability NAWCAD brings to the Navy and ultimately, to the fight.

We Are Naval Aviation

The United States boasts the most lethal and capable armed forces in the history of the world. Our brave warfighters—Sailors, Marines, Soldiers, Airmen and Guardsmen—have proven their excellence and proficiency across the entire spectrum of conflict in myriad locations across the globe. Key to our military's success is our Sailors' and Marines' toughness, training, superior equipment and ability to adapt to increasingly complex threats from peer and near-peer forces, as well as rogue and failed states, and the terrorists and non-state actors they often breed.

NAWCAD proudly continues to provide the talent, tools and technologies in support of Naval Aviation, other services, federal agencies, academia and industry partners that help ensure our warfighters maintain their edge and always go into a conflict with significant advantage.



Rear Adm. John Lemmon is a native of Champaign, Illinois, and a graduate of the U.S. Naval Academy, Naval Post Graduate School and the U.S. Naval Test Pilot School.

After earning his wings as a naval aviator in 1990, he flew the E-2C Hawkeye in support of operations aboard USS Forrester (CV 59), USS Theodore Roosevelt (CVN 71) and USS John F. Kennedy (CV 67). He also served as commander, Task Group 67.8, Horn of Africa. His flight test experience includes tours at Naval Air Warfare Center Aircraft Division (NAWCAD) where he worked on numerous upgrades to E-2 and C-2 Greyhound aircraft, and later as Commanding Officer of Air Test and Evaluation Squadron (VX) 20.

Grampaw Pettibone

Gramps from Yesteryear: November-December 2001

Illustration by *Ted Wilbur*



leader in joining up on the tanker. The flight closed to 2 miles in trail of the F-14s while the 3-plane flight of F/A-18s was six miles ahead. The wingman continued to devote most of his time to duties other than formation flying. The leader entered a descending 60-degree left angle of bank turn for 15 seconds. The wingman responded with a 35-degree angle of bank left descending turn. During this turn, a 24-degree heading difference developed between the two aircraft. The wingman was about 700 feet above the leader's altitude.

The wingman did not recognize the heading differential or the resulting closure rate. Both Hornets rolled wings level with a 21-degree heading difference and the wingman 300 feet above the leader. The wingman did not recognize the rapidly increasing size of the leader's aircraft due to scan breakdown and self-induced task saturation. The leader started an easy right turn, while the wingman continued a slight descent until the aircraft collided at a closure rate of approximately 180 knots with a 17-degree heading difference. The wingman immediately initiated successful ejection, but the leader was killed on impact. 🛩️

Nighttime Nightmare

A strike package comprised of 12 aircraft launched from the carrier, in sections, on a night strike familiarization flight. The aircraft were to conduct in-flight refueling, also in sections, before proceeding on the mission. Due to excessive traffic overhead the carrier, the rendezvous point for one section of F/A-18 Hornets was altered by the section leader after becoming airborne. The two aircraft joined at a point 10 miles northwest of the ship and proceeded toward the tanker which was flying at 22,000 feet. Both pilots were wearing night vision goggles (NVG).

Established in spread formation with the wingman on the leader's left side, the flight maneuvered to a 3-mile trail position behind a flight of three F-14 Tomcats also proceeding to the tanker. At this time a flight of three Hornets was also approaching the tanker at the section's 11 o'clock position about 12 miles away.

The section leader's wingman was spending 60 percent of his time monitoring traffic on radar and visually trying to assist the

Grampaw Pettibone says ...

It's a heckuva workload speedin' through the sky at night, wearin' NVGs and makin' your way to the tanker with a bunch of fast movin' birds in close company. The wingman lost situational awareness in this case because he was tryin' to do too much beyond his primary duty of flying as wingman. He violated a basic, fundamental task of formation flying: avoid flyin' into your lead.

Also, the flight did not brief for and subsequently did not use the air-to-air function of the tactical aid to navigation system, which mighta helped the fliers track their distance from each other. 'Nuff said. 🛩️



Compiled by Andrea Watters and Rob Perry

Ninth Air Boss Assumes Command of Naval Air Forces



Vice Adm. Kenneth Whitesell, right, relieved Vice Adm. DeWolfe Miller III, left, as Commander, Naval Air Forces/Commander, Naval Air Force, U.S. Pacific Fleet, Oct. 2 aboard USS Theodore Roosevelt (CVN 71) as Adm. John Aquilino, Commander, U.S. Pacific Fleet, center, presided over the change of command.

SAN DIEGO, Calif.—Vice Adm. Kenneth Whitesell relieved Vice Adm. DeWolfe Miller III to become Commander, Naval Air Forces/Commander, Naval Air Force, U.S. Pacific Fleet during a ceremony Oct. 2 aboard USS Theodore Roosevelt (CVN 71) at Naval Air Station North Island in San Diego.

The event was also a retirement ceremony for Miller who was presented with the Distinguished Service Medal after a career spanning more than 39 years of distinguished service.

In his remarks, Miller described his career in the Navy through the perspective of an aircraft carrier pilot departing on an operational mission.

“All strapped in, engines started, avionics all set up; I know the checklist by heart,” he said.

Miller also voiced his appreciation for aviation maintenance and support personnel who “without fanfare, climb all over aircraft under the most extreme conditions to ensure they (the aircraft) are

ready and safe, so our Navy can accomplish its mission from the sea. Their work is never done, but it is always well done.”

Turning to Whitesell and his wife, Miller said, “Kenny and Melody, you’re inheriting an amazing team ... you are the perfect couple to lead Naval Aviation into the future.”

Whitesell said, “It is an honor to become the ninth ‘Air Boss.’ The list of those who have served under the title of Air Boss ... remain the titans of Naval Aviation.”

“Our people remain the competitive advantage,” said Whitesell, who also said he will ensure Naval Aviation continues to focus on “superiority in aerial combat execution and coordination across multiple domains.”

Adm. John Aquilino, Commander, U.S. Pacific Fleet, presided over the ceremony and expressed his gratitude to Miller and Whitesell for the opportunity to “celebrate this event with two of my closest friends in the Navy.”

When addressing Miller’s character and accomplishments, Aquilino said, “When I hear Adm. DeWolfe Miller’s name, here’s what I think of: a proven lethal combat pilot, commander of a U.S. aircraft carrier as a captain and as a strike group commander, husband, father, family man, mentor, leader and friend ... Because of your rigorous, tireless commitment, the Navy is in a better place today.”

Whitesell previously served as deputy commander of U.S. Pacific Fleet and has completed operational assignments with F-14 Tomcat and F/A-18 Super Hornet squadrons, and commanded Strike Fighter Squadron (VFA) 41, Carrier Air Wing (CVW) 1 aboard USS Enterprise (CVN 65), and Carrier Strike Group (CSG) 2 aboard USS George H.W. Bush (CVN 77).

Whitesell is a graduate of the Navy Fighter Weapons School (TOPGUN) and participated in operations Desert Shield, Southern Watch, Deliberate Guard/Allied Force, Iraqi Freedom and Inherent Resolve. He has accumulated more than 4,000 flight hours and 1,000 aircraft carrier landings.

Miller closed his comments by describing the end of his naval career as if he was preparing to land on the carrier flight deck.

“Let’s make this last one look really good,” he said.

From Commander, Naval Air Forces Public Affairs. 🦋

Naval Aviation Community Adapts with 'VHook '20'

PENSACOLA, Fla.—The Tailhook Association hosted its first virtual symposium on Sept. 11-12 from the National Naval Aviation Museum in Pensacola, Florida. Virtual Hook 2020, dubbed "VHook '20," featured Naval Aviation leaders participating from the museum or via remote locations as viewers watched live online.

The association, an independent, nonprofit organization supporting aircraft carrier and other sea-based aviation, had planned to hold its annual conference at its usual location in Reno, Nevada, but organizers shifted to a virtual event to comply with Navy policy and CDC guidance in response to the COVID-19 pandemic.

Using the museum as backdrop for discussions around the most urgent developments and trajectory of Naval Aviation, this year's symposium focused on naval air training with several panels discussing past, present and future training curriculum, equipment and innovations. The symposium also featured senior leader discussions on the current and future states of Naval Aviation and Naval Aviation's increasingly important role in maintaining credible combat power.

Vice Adm. DeWolfe Miller III, then-commander, Naval Air Forces, led the flag and general officer panel that included Lt. Gen. Mark Wise, Deputy Commandant for Aviation, Headquarters Marine Corps; Vice Adm. Dean Peters, commander, Naval Air Systems Command; Rear Adm. John Meier, commander, Naval Air Force Atlantic; Rear Adm. Gregory Harris, director, Air Warfare Division, Office of the Chief of Naval Operations; Rear Adm. Scott Jones, commander, Naval Air Force Reserve; Rear Adm. Richard Brophy, commander, Naval Aviation Warfighting Development Center; Rear Adm. Robert Westendorff, Chief of Naval Air Training; Rear Adm. Lance Scott, commander, Patrol and Reconnaissance Group Pacific; and Rear Adm. Alvin Holsey, director, Task Force One Navy.

Among other topics, leaders discussed the carrier air wing of the future.

"I'll never stop saying it: the nuclear-powered aircraft carrier is one of the 11 most survivable airfields in the world," Harris said. "You put on top of that a flexible carrier air wing, supported by a carrier strike group and all the capabilities that are resident with our flight III DDGs [guided-missile destroyers] and the rest of our systems, you have an amazing capability that is able to strike at range, at depth and with volume."



U.S. Navy photo by Capt. Scott Janik

The Navy's newest naval flight officer and naval aviators receive their coveted Wings of Gold at the National Naval Aviation Museum aboard Naval Air Station Pensacola, Fla., during the 2020 Virtual Tailhook Symposium.

Harris also mentioned how the next-generation air dominance family of systems will enable carrier strike groups to decisively strike targets at range in a contested environment.

Wrapping up the flag panel, Miller reflected on his 44-year career in the Navy by recounting his recent visit to his former ship USS Midway, now a museum ship in San Diego, California.

"Standing on my old ship, looking around at all the retired platforms—the A-1 Skyraider, the A-4Es and S3s—Naval Aviation's adaptability was right in front of me," Miller said. "As our capabilities and platforms evolve, we evolve quickly, and the training has always evolved quickly."

While the platforms may have changed, "what hasn't changed is the deep-rooted determination of Naval Aviation's Sailors and Marines," Miller said. Miller retired in October.

Peters chaired the Future Readiness panel leading a discussion among Meier, Harris, Col. Russell Blauw, Assistant Deputy

Commandant for Aviation, and Rear Adm. Joseph Noble Jr., commander, Naval Supply Systems Command Weapons Systems Support. The panel focused on new concepts that have provided boosts to readiness over the last year.

Meier recounted the success of the commercial-inspired Maintenance Operations Center (MOC)/Aircraft-on-Ground (AOG) cell that has provided incredible value to readiness by turning around long-term downed aircraft. Peters also emphasized the importance of data transparency and reliability to future readiness.

The virtual conference also included a winging ceremony. Virtual attendees watched as two pilots, Lt. j.g. Nicholas Mascaro and Lt. j.g. Thomas Fogwell, and a naval flight officer, Lt. j.g. Christine Walker, received their coveted wings of gold at the museum.

In the closing address, Adm. Mike Gilday, Chief of Naval

Operations, opened his remarks with praise for Naval Aviation's response to the pandemic.

"It has been a challenging year for our navy and for our nation," Gilday said. "Yet, in every moment, you rose to the occasion. Whether it was strike group extensions, record-setting days at sea, flexing deployment schedules or keeping the training pipeline open, you always remain ready and overhead, keeping America safe and the seas free and open."

In closing, Gilday said, "Naval Aviation will play a vital role, and new platforms like the Ford-class carrier, the F-35, the Osprey and the MQ-25 will take our Navy and our nation far into the future. As we test and incorporate new technologies, one thing is for certain: We will need that same bold, aggressive spirit of Naval Aviation to help chart our course."

From Naval Aviation Enterprise Public Affairs. 🇺🇸

Advanced Helicopter Training Program Contract Awarded

PATUXENT RIVER, Md.—The Navy awarded an indefinite delivery, indefinite quantity contract to FlightSafety Services Corporation on Aug. 25 for Aircrew Training Services (ATS) in support of the Advanced Helicopter Training System (AHTS) program.

The five-year base contract is for \$220,766,476 for TH-73A ATS, which includes availability on 18 Flight Simulation Training Devices (FSTDs). The total contract value is \$363,492,518. FSTDs are scheduled to be available in calendar year 2021 and will continue through calendar

year 2026. The government received two proposals for the contract.

"This ATS contract is a key component to the Advanced Helicopter Training System because it provides contract instructors and state-of-the-art FSTDs for the new Leonardo TH-73A helicopters," said Capt. Holly Shoger, Naval Undergraduate Flight Training Systems program manager. "The TH-73A will provide a modern helicopter training platform that will serve rotary and tiltrotor training requirements into the foreseeable future. These new helicopters

will ensure the Navy has the capacity to train several hundred aviation students per year at Naval Air Station Whiting Field in Milton, Florida."

The ATS procurement includes contractor instructional services and FAA-equivalent flight training devices that will improve pilot training and skills by using current technologies and a modernized training curriculum that reflect the capabilities in the current Navy, Marine Corps and Coast Guard inventory.

Using a skills-based approach to training with just-in-time methodology, and by incorporating modern technology, AHTS will help produce high quality rotary-wing aviators more efficiently. Aviators will be ready to meet the challenges faced in the fleet and the advanced rotary-wing and intermediate tiltrotor training requirements for the Navy, Marine Corps and Coast Guard through 2050.

The award is the culmination of a competitive source selection process supported by personnel from Naval Air Systems Command and the Chief of Naval Air Training.

From Program Executive Office (Tactical Aircraft Programs) Public Affairs. 🇺🇸



Courtesy photo

The Navy awarded a contract for Aircrew Training Services in support of the Advanced Helicopter Training System program on Aug. 25 that will improve pilot training and skills by using current technologies and a modernized training curriculum.

METCAL Recall: A Case Study in Urgency, Collaboration

PATUXENT RIVER, Md.—In the days leading up to the Independence Day weekend, several fleet and maintenance activities reported multiple tolerance failures for calibration workloads run across their torque benches—a problem ultimately diagnosed as a fleetwide metrology and calibration (METCAL) quality issue requiring a quick response and solution.

Subject matter experts discovered the torque calibrator exchange kits were malfunctioning. The kits are used to calibrate torque benches at the fleet's intermediate-level maintenance activities. Torque benches then calibrate torque devices, such as wrenches, multipliers and tensiometers before being used to conduct aircraft maintenance.

Maintainers use wrenches to torque the most critical flight parts and assemblies on naval aircraft. Calibrated tools are essential to maintaining aircraft airworthiness, and this quality deficit posed a clear safety risk that needed a quick resolution.

In less than two weeks, experts from the Naval Air Systems Command's (NAVAIR) METCAL Program Office, Fleet Readiness Center East (FRCE), Commander, Fleet Readiness Centers (COMFRC), the Fleet Calibration Type Commander, Naval Air Warfare Center Aircraft Division (NAWCAD), and the Common Aviation Support Equipment Program Office discovered a proving ring was out of tolerance, introducing significant errors to 18 torque calibrator exchange kits distributed across the fleet.

On July 1, the METCAL issue was reported to FRC Southeast and COMFRC leadership and all potentially affected kits and commands were identified. The next day, assets were evaluated as additional analysis was conducted while impact charts were drafted and a bulletin was worked.

Initial analysis revealed as many as 710 items were miscalibrated.

On July 9, an engineering assessment

a specific skill set because one has to listen and feel for when the reed comes in contact with the ball.

By Aug. 14, a recall was completed on 14 of the 18 affected kits; FRCSE had one kit in-house and was awaiting the arrival of the final three.

The team accomplished all of this with data from systems not typically used for the analysis of maintenance impacts and by using Microsoft Teams, email and other teleconferencing capabilities.

Ultimately, 254 items across several fleet activities required recalibration. To date, more than 85 percent of the recalled fleet torque tools have been recalibrated and returned to service. Fortunately, the quality escape did not impact the airworthiness of any aircraft.

In light of this, the team developed a new calibration process, which calls for incorporating visual inspections and verification checkpoints during the fleet exchange kit's calibration; providing training on the procedure; and revising technical publications to include

mechanically exercising the proving ring and confirming proper functionality before using it as a measurement reference.

The team's exemplary work and timely response prevented the prevalence of a safety issue that had the potential to impact fleet readiness on a large scale.

From Naval Air Systems Command Public Affairs Office. 🇺🇸



Photo courtesy of Morehouse

A damaged reed was discovered by maintenance activities after reporting multiple tolerance failures for calibration workloads run across their torque benches.

was completed, but the team needed assistance from the manufacturer to determine the true root cause. Further research revealed the proving ring's manually operated vibrating reed, which is about 0.325 inches wide, had a microscopic chip on its tip. Morehouse, the original equipment manufacturer, discovered the fracture and said the damage was not unusual. Reed calibration is done by hand and requires

HSC-22 Receives First MQ-8C Fire Scout

NORFOLK, Va.—Helicopter Sea Combat Squadron (HSC) 22 received their first MQ-8C Fire Scout on Sept. 15 aboard Naval Station Norfolk.

HSC-22 marks the first East Coast squadron to operate all three systems—the MH-60S Seahawk, MQ-8B Fire Scout and MQ-8C Fire Scout. The MQ-8C combines the capabilities of the MQ-8B with the MH-60S Seahawk to improve the Navy's ability to investigate and target hostile surface contacts.

"Incorporating the MQ-8C will represent a significant improvement in our unmanned air vehicle mission capability," said Cmdr. Matthew Wright, HSC-22's Commanding Officer. "The 'Charlie' is bigger, faster, can carry more mission equipment and remain airborne more than twice as long as our already-proven MQ-8Bs."

Fire Scout B and C variants are designed for suitably equipped ship-based and land-based autonomous systems. MQ-8B and C Fire Scout/MH-60S extend Naval Aviation's capability to support distributed maritime operations providing integrated, over-the-horizon intelligence, surveil-

lance, reconnaissance and targeting and combat logistics support.

While the majority of the flight software is similar, the aircrews must adapt to the new capabilities of upgraded unmanned aircraft system (UAS) and the maintenance team must obtain additional qualifications.

Lt. Ryan Jaenke, MH-60S, MQ-8B/C pilot, discussed the advanced capabilities of the MQ-8C.

"The MQ-8C Fire Scout is the latest step toward increasing the duration that UAS has on the battlefield as well as the impact. It advances the reliability of UAS as well as leaves a larger impact on the battlefield in missions that are not new to today's warfighter," Jaenke said.

HSC-22's mission is to provide manned and unmanned maritime attack and combat support capabilities to the fleet; the squadron's inherent versatility provides full-spectrum warfighting support across multiple mission-sets and diverse and distributed platforms.

From Commander, Naval Air Force Atlantic Public Affairs. 🦅

Sailors from Helicopter Sea Combat Squadron (HSC) 22 observe as an MQ-8C Fire Scout is delivered to the squadron at Naval Station Norfolk.



U.S. Navy photo by MC3 Sam Jenkins



VAW-126: First Aerial-Refueling Qualified Fleet Squadron

NORFOLK, Va.—The Seahawks of Airborne Command & Control Squadron (VAW) 126 became the Navy's first fleet E-2D Advanced Hawkeye squadron to qualify its pilots in aerial refueling (AR) on Aug. 14.

After completing 81 simulator and aircraft training events, the Seahawks qualified their first two pilots on an Air Force KC-10 Extender aircraft from the 32nd Aerial Refueling Squadron based at Joint Base McGuire-Dix-Lakehurst, New Jersey. They achieved 33 total plugs and received 12,000 pounds of fuel.

"The dedication displayed by our maintainers, our aircrew and our Sailors is simply awe-inspiring. The squadron came together as a unified team to achieve this goal," said Cmdr. Marc Foreman, VAW-126 Commanding Officer.

Since Aug. 14, the squadron has trained more than 10 pilots on aerial refueling with an Air Force KC-10 Extender and Omega 707. Aerial refueling is a significant airframe modification that is redefining the E-2D community's impact in the carrier environment and warfighting battlespace. It enables crews to increase mission persistence, cover longer distances in less time and maximize operational flexibility.

"Adding aerial refueling to the Advanced Hawkeye is a game-changer," Foreman said. "The women

and men of VAW-126 are leading the way in its tactical development and employment."

The AR-modified E-2D is a key component to the carrier air wing of the future and VAW-126 is at the forefront as it integrates this new capability with the rest of Carrier Air Wing (CVW) 1 and Carrier Strike Group (CSG) 8.

Lt. Nicholas Dewispelaere was one of the first pilots to qualify in AR with a KC-10 Extender.

"As an aviator, we spend considerable time building proficiency on numerous mission sets; it is motivating and rewarding to master a new skill and develop this new capability," Dewispelaere said.

VAW-126, a Norfolk, Virginia-based Advanced Hawkeye squadron, is tasked with ushering in the AR modification to the Airborne Command & Control community and the fleet.

The Seahawks are currently qualifying all of their pilots in day and night aerial refueling on the Omega 707 and KC-10 platforms. The Seahawks will work to expand their pilot's AR experience to other tanker platforms, including the F/A-18 Super Hornet and KC-135 Stratotanker, at the same time developing the techniques and procedures for training and employment of this new capability.

Written by Lt. Patrick Hayes, Airborne Command & Control Squadron (VAW) 126 Public Affairs. 🦅

An E-2D Advanced Hawkeye conducts aerial refueling with a KC-707 Omega.



U.S. Navy photo by Paul Lagasse

NASA research pilot and U.S. Naval Test Pilot School (USNTPS) instructor Cmdr. Adam Klein, right, prepares for a T-38C training flight with USNTPS student Lt. Spencer Smith.

Test Pilot School Partners with NASA for Student Training

PATUXENT RIVER, Md.—The United States Naval Test Pilot School (USNTPS) is the Navy’s principal operator of the T-38C Talon supersonic jet trainer, with 10 of the twin-engine aircraft in its inventory. The school’s T-38s fly an average of 1,100 hours per year, providing students with valuable experience evaluating its performance, flying qualities, dynamics and transonic and supersonic flight characteristics.

Because the T-38C is the school’s primary fixed-wing trainer, students are required to receive formal flight training in the aircraft prior to their arrival. In the past, this has been done at the Air Force’s Air Education and Training Command (AETC) at Randolph Air Force Base in Texas. However, with the COVID-19 pandemic, AETC had to pare back its training commitments to the Navy and its other customers.

With a new class of students preparing to arrive in September, USNTPS had to find an alternative—and quickly.

USNTPS turned to its long-standing partner, NASA, for assistance. NASA

operates the T-38N variant, which is primarily used for astronaut space flight readiness training, and a T-38N simulator, which is used to train basic and emergency procedures as well as crew resource management.

After determining the availability and feasibility, the school quickly worked with NASA to tailor a simulator training program to the school’s unique requirements. An inter-agency agreement was quickly drafted and funds were transferred to formalize the training program.

Observing strict travel and quarantine guidelines to ensure protection against exposure to COVID-19, five test pilots under instruction (TPUI)—the formal name for the students who attend USNTPS—traveled to the Johnson Space Center in Houston, Texas, this summer for training in the NASA simulator. The training was conducted by Cmdr. Adam Klein and Cmdr. Dick Clark, both of whom are USNTPS graduates and former USNTPS staff members, and NASA flight instructors.

“NASA appreciates its professional partnership with USNTPS, and we

recognize the critical importance of pre-arrival training for fixed-wing students,” said Klein, a NASA research pilot who also serves his military reserve duty as a flight instructor at USNTPS. “We were happy to assist.”

Klein said that although the avionics of NASA’s “N” series aircraft differ from the “C” series flown by USNTPS, the fidelity of the simulator’s flying qualities and performance were high enough to be an effective trainer for the T-38C.

“While the differences between the two series of aircraft might normally be a detriment to the training flow of a fleet pilot, USNTPS is training TPUIs who need to rapidly adapt to new aircraft and interfaces,” Klein said. “By exposing the TPUIs to the T-38N simulator, the students were able to receive the critical T-38 transition training while also receiving a test pilot school primer.”

USNTPS Commanding Officer Lt. Col. Rory Feely praised USNTPS and NASA personnel for transforming a problem into an opportunity, and singled out the school’s finance and legal teams, academic

and flight instructors, and the maintenance team that keep the school's aircraft flying year-round.

"All of them kept pressing the issue in order to achieve success," Feely said. "I give my humble thanks to the teams that find innovative ways to bypass obstacles to success on a daily basis."

The school's partnership with NASA has paid significant dividends over the years. Not only do NASA pilots like Klein fly on the USNTPS staff, but the school recently hosted NASA's WB-57F high-

altitude research aircraft when a launch observation mission brought it to the mid-Atlantic region.

USNTPS personnel supported NASA and learned how NASA conducts high-altitude research flight in full-pressure suits. NASA, in turn, provides major maintenance and painting of the school's T-38C aircraft.

"Partnerships are a significant contributor to the successful operation of USNTPS and allow us to execute operations of this magnitude with about half the person-

nel strength of a similarly sized military squadron," Feely said.

USNTPS is one of the busiest squadrons in the U.S. Navy and Marine Corps, executing nearly 4,500 sorties annually. The school flies 44 aircraft and unmanned systems representing 14 different types, models and series. Some of its aircraft are the longest serving military aircraft in DOD.

Written by Paul Lagasse, public relations specialist with U.S. Naval Test Pilot School. 🛩️

CNAL Restores EA-18G, Boosts Readiness

NORFOLK, Va.—Commander, Naval Air Force Atlantic (CNAL) continues its commitment to improving the culture of maintenance best practices implemented under the Naval Sustainment System-Aviation effort one aircraft at a time.

A recent example is the restoration and return of an EA-18G Growler to a Whidbey Island-based squadron completed under the management of Bob Alley, F/A-18 class desk inventory manager.

"Originally, this aircraft suffered a hot air leak in its engine bay that resulted in damage to the side of the aircraft," said Alley, a former master chief avionics technician.

The Growler departed Naval Station Norfolk in July, returning to its home at Naval Air Station (NAS) Whidbey Island, Washington, newly assigned to Electronic Attack Squadron (VAQ) 129. The repaired EA-18G Growler had 607 hours on its airframe. An EA-18G has an aircraft lifespan of 7,500 hours.

"While this aircraft was originally assigned to VAQ-140, returning these types of aircraft to the fleet helps inventory pressures because of deployments and helps to maintain readiness," Alley said. He has been working with Fleet Readiness Center Mid-Atlantic and the engineers from the Fleet Support Team in North Island, California, to restore this aircraft.

Lt. Cmdr. Dave Badman, Commander, Electronic Attack Wing U.S. Pacific Fleet maintenance officer at NAS Whidbey Island, emphasized the team effort involved.

"We are appreciative of the countless number of personnel involved and hours expended to return this aircraft back to the fleet to increase our overall readiness," Badman said.

Repairing this aircraft included several firsts.

"To my knowledge, repairs have not been attempted on any previous aircraft damaged in the engine," Alley



U.S. Navy photo

A restored EA-18G Growler is on its way to Electronic Attack Squadron (VAQ) 129 at NAS Whidbey, Wash.

said. "For these types of aircraft, it's a lot like performing a difficult surgery for the engineers that are charged with repairing them."

While doctors use scalpels, engineers use science, technology, engineering and math modeling to determine the level of repairs needed, he said.

"We are using repair techniques and strategies that we have not used before, different patches that we have not used before, and the engineers had to come up with a repair that will last the aircraft's lifetime," he said.

While it took hundreds of man-hours to restore this aircraft, it was worth it, Alley said.

From Naval Air Force Atlantic Public Affairs. 🛩️

Flexible Manufacturing Cell Slated for FRCSW Landing Gear Shop

NORTH ISLAND, Calif.—Landing gear to the F/A-18 Hornet and E-2/C-2 aircraft will be reworked and returned to the airframes much faster and at a lower cost thanks to an initiative by Fleet Readiness Center Southwest (FRCSW) and the Defense Logistics Agency Aviation to establish a Flexible Manufacturing Cell (FMC).

The FMC is an automated system comprised of six, five-axis machines and a palletizing system that will be installed in the existing landing gear shop at FRCSW.

Five-axis machines are computer numerically controlled (CNC) equipment that use multi-axis tooling to rotate around one or more axis to manufacture metallic parts and components.

The pallet system will move the landing gear through the repair process, automatically performing required set ups and manage the parts inventory.

An “all-in-one” device, the FMC is programmable for milling, turning and inside diameter and outside diameter grinding. FMC use almost eliminates human interaction with components, reducing the potential of error.

Remanufacturing of the F/A-18 main landing gear trunnion (the pivoting point where landing gear move for landing and stow for flight), for example, requires 11 different machining



U.S. Navy photo by MCS Joseph A.D. Phillips

applications totaling more than 80 hours of setup and operational time. The versatility of the FMC significantly reduces that to only six hours, saving more than \$17,000 in labor costs per trunnion.

The manufacturing of other landing gear components will realize similar cost reductions.

To maintain continuity with existing CNC systems, the FMC features a compatible standard, central control system

First Upgraded-Prop KC-130T Tests Aerial Refueling



U.S. Navy photo

A KC-130T Hercules, equipped with NP2000 Propeller System, conducts an aerial refueling mission with an MV-22 Osprey during a test flight Aug. 24.

PATUXENT RIVER, Md.—A KC-130T Hercules equipped with the new NP2000 Propeller System completed an aerial refueling (AR) mission with an MV-22 Osprey during a test flight Aug. 24.

The KC-130T is currently undergoing testing that will qualify it to become the first NP2000-configured aircraft in the DOD certified to conduct AR missions. The NP2000 upgrade transitioned the C-130T's propeller system to eight composite blades on each hub and an enhanced electronic control system.

“This is a critical certification to increase the U.S. Navy's capability to provide global aerial refueling support to the forward deployed forces,” said Capt. Steve Nassau,

A Sailor watches as an E-2D Hawkeye, attached to the "Seahawks" of Airborne Command & Control Squadron (VAW) 126, prepares to land aboard Nimitz-class aircraft carrier USS Harry S. Truman (CVN 75).

An F/A-18E Super Hornet, attached to the "Wildcats" of Strike Fighter Squadron (VFA) 131, lands on the flight deck of aircraft carrier USS Dwight D. Eisenhower (CVN 69).

U.S. Navy photo by MCS Orion K. Shotton

eliminating user-training requirements and eliminates the need to develop new software interface programs.

The move will save more than \$1.3 million annually in related manpower and programming costs.

The system is equipped with a timer to perform automatic warmup and shutdown procedures. Machines currently need a warming period requiring a machinist to devote two hours daily. With the FMC timer, the warming period overseen by

Tactical Airlift Program manager. "The U.S. Air Force C-130H did not have the requirement to conduct AR when they transitioned from legacy propellers to the NP2000. This left the USN KC-130T fleet, currently transitioning to the NP2000, to fulfill this requirement."

This particular aircraft had not flown for almost a year and was scheduled for sundown by the Marine Corps after the last Marine Aerial Refueler Transport squadron in New York transitioned to the newer KC-130J models.

The Navy coordinated with the Marine Corps to transfer the aircraft between inventories and the program office and Fleet Logistics Support Wing completed the required maintenance to bring the aircraft back to life and modified it with NP2000. The program office, the V-22 Joint Program Office and Air Test & Evaluation Squadron (VX) 20 teams coordinated the test event.

Upon completion of certification, the NP2000 and AR configured aircraft was transferred to Navy Fleet Logistics Support Squadron (VR) 62 to begin its new role.

Written by Valerie Doster, Tactical Airlift Program Office Communications Specialist. 🐦

personnel is eliminated, saving approximately \$219,000 annually.

The FMC palletizing system will be fully enclosed with a sliding door roof, able to accommodate the placement and removal of large parts. Assembly of the palletizing system will follow the installation of the primary FMC components.

For tool changing, a standardized HSK-A spindle tool holder will replace the current CAT 40/50 holders. The HSK-A is not only more versatile but able to fit machines without the need to change pull studs, saving more than \$102,000 annually in man-hours devoted to that task.

Another \$103,500 per year will be gained by use of the 3D quickset tool kit. The tool kit eliminates the weekly accuracy alignments necessary for four/five axis machines, reducing setup time for machining.

Because of its ability to share data with other computing and manufacturing systems and technologies like cloud and cognitive computing, the FMC will help with planning and managing schedules and costs.

The system will also feature two manufacturing options: ultrasonic machining and a blown powder/laser ablation for additive manufacturing. Ultrasonic machining will enable the FMC to machine thin coatings to hard alloys that require separate grinding. The blown powder/laser ablation for additive manufacturing allows the rebuilding of surfaces damaged by corrosion, reducing the number of scrapped components.

In addition to F/A-18 and E-2/C-2, the FMC will be adaptable to service F-35 landing gear, as well.

Costing about \$17 million, the FMC is designed and manufactured in Germany by DMG-Mori, USA. Installation is scheduled for March 2022.

From Fleet Readiness Center Southwest Public Affairs. 🐦



U.S. Marine Corps Photo by Lance Cpl. Dalton S. Swanbeck

An MV-22 Osprey with Marine Medium Tiltrotor Squadron (VMM) 163 (Reinforced), 11th Marine Expeditionary Unit, takes off from amphibious assault ship USS Boxer (LHD 4).



U.S. Navy photo by MC3 Rebekah M. Rinckey

Aircraft carrier USS John C. Stennis (CVN 74) transits the Atlantic Ocean.

CVN-74 with CVW-9 and LHD-4 with 11th MEU Earn Aviation Safety Award

NORFOLK, Va.— USS John C. Stennis (CVN 74) with Carrier Air Wing (CVW) 9 and USS Boxer (LHD 4) with the 11th Marine Expeditionary Unit (MEU) received the annual Adm. Flatley Memorial Award for Aviation Safety.

The award recognizes operational readiness and excellence, high-velocity outcomes and exceptional safety program and record for the last fiscal year.

Sailors and Marines on flight decks across the naval enterprise perform complex and hazardous tasks, sometimes for long hours, to accomplish the mission. One commonality among these Sailors and Marines is the often-unsung heroes who work side-by-side, ensuring their safety for every evolution.

Sailors wearing the green cross on the back of their MK-1 life preservers (float coats) belong to the ship's Safety Division and their sole objective is to safeguard every Sailor and Marine's safety onboard the vessel. Working with the ship's crew and their CVW or MEU counterparts, these integrated teams strive to maintain the highest state of operational readiness by ensuring safety is inculcated into every activity.

The award recipients' safety teams excelled at their mission by providing a safe working environment during complex evolutions.

Among their accomplishments, the Boxer's compliance with Occupational Safety and Health programs helped lead the ship to a Class A and B mishap-free year. Boxer heightened the crew's risk awareness through training, supervision and ensuring operational risk management training requirements were met by reviewing them during safety stand downs. Additionally, Boxer developed a safety database of discrepancies found during daily walk-throughs of the ship, enabling the Safety Division to post discrepancies, manage mitigation efforts and improve the overall safety of the workplace.

An effective safety team is "focused on the same safety mission, identifying hazards, working safely and preventing accidents," said Aviation Boatswain's Mate 1st Class Erika Velezvelez, Boxer safety team member. "Overall, safety teams understand safety goals and are committed to achieving them. Everyone works together toward the same goal to achieve success."

For Stennis with CVW-9, the team

improved its hazard awareness, procedural processes and training. This collaboration established the conditions for 10,403 incident-free fixed-wing launches and recoveries, 11,126 successful sorties, qualification of 42 student naval aviators and zero Class A mishaps during the last fiscal year.

Winning the award "is a direct reflection on our ability to do risk mitigation and do it effectively so we can preserve our material and personnel assets," said Lt. Steve Augustine, Stennis' industrial hygiene officer.

A well-managed safety team does more than ensure crew safety—it gives Sailors and Marines assigned to the unit a sense of comfort when completing tasks with an assumed level of danger.

"It creates a safety culture where everyone is committed to working safely as a team, efficiently accomplishing missions and ensuring personnel well-being, both physically and mentally," said Chief Aviation Machinist Mate Timothy John Merilos, Boxer safety division leading chief petty officer.

Written by Mass Communications Specialist 2nd Class Joseph Holbert, Naval Safety Center Safety Promotions. 🦋

FRCE Apprentice Program: Learning while Earning

CHERRY POINT, N.C.—Twenty new employees reported for duty at Fleet Readiness Center East (FRCE) Aug. 10 as part of a nationally standardized pipeline through which FRCE can hire and train a workforce of highly skilled aircraft mechanics.

The Naval Air Systems Command's (NAVAIR) National Apprenticeship Program is designed to offer qualified applicants the opportunity to work fulltime as federal employees, receiving pay and benefits, as they pursue a combination of education and on-the-job training. This is FRCE's second class of apprentices.

"When we bring them in, they don't have to have any trade background, because we're going to train them from the ground up," said Doug Preneveau, FRCE apprentice program administrator. "We welcome them into the FRC, and then we send them to college for two semesters to go through set courses for workforce development, trade theory and technology training."

The apprentices complete an industrial systems technology certificate at Craven Community College. FRCE pays the full tuition. Once their coursework is complete, they will spend the next three years alternating between on-the-job and classroom training to learn their specific trades. When they complete the four-year-program, they can be hired as permanent journey-level mechanics in trades such as sheet metal mechanics, machinists, pneumatic system mechanics and aircraft mechanical parts repairers.

"It's a fantastic opportunity to get your foot in the door with a good organization. They give you all the skills you need to succeed in the position you're being hired for," said Branson Caward, who was looking for a solid career path

after serving in the Marine Corps and working in a variety of industries.

The first group of nearly 40 apprentices started a year ago in August 2019. Crystal Gent is part of that class, and she has spent the last couple of months learning to repair H-53 gearboxes under the direction of training leaders in FRCE's Gearbox Shop. She said the apprentice program checked all the boxes for what she was looking for in a career.

"I really enjoy mechanic work," Gent said. "I was looking for a government job, and I thought this would be a great way to get in and to do what I like to do."

Preneveau said the apprentice program was in the works for about three years before it welcomed its first class of trainees last year. NAVAIR standardized the program across its Fleet Readiness Centers, so apprentices at all NAVAIR maintenance facilities will receive the same training and certifications. The program has been registered with the Department of Labor on both the state and national levels.

Acceptance into the program is highly competitive. Preneveau said that this year's class of 20 apprentices was selected from more than 320 applicants. FRCE is scheduled to continue the program over the next several years, hiring apprentices to help grow the workforce of skilled aircraft maintenance professionals.

The minimum requirement is a 2.8 grade point average in either high school or college coursework, and a trade background is a plus, but not required.

Preneveau recommends that future applicants register with USAJobs.gov to receive notification when recruitment opens for the next apprentice class in early 2021.

From Fleet Readiness Center East Public Affairs. ✈



Crystal Gent, left, a Fleet Readiness Center East aircraft mechanical parts repairer apprentice, assists Joshua Maragni, aircraft mechanical parts repairer, in using a crane to lift a nose gearbox assembly for the H-53 helicopter.

CH-53K Tests its Power at U.S. Army Yuma Proving Ground

YUMA, Ariz.—The CH-53 has been a potent member of the Marine Aviation fleet for more than 40 years, but the newest version takes the platform to a whole new level.

Equipped with three, 7,500 horsepower engines, the CH-53K King Stallion boasts twice the heavy-lift capability over its predecessors.

The most impressive new feature, though, is fly-by-wire technology that computerizes flight controls and represents a major advancement over hydraulic ones. In addition to making the aircraft lighter, the new controls assist pilots, particularly in degraded visual environments.

The CH-53K has undergone extensive developmental testing that utilized the degraded visual environment (DVE) test course at U.S. Army Yuma Proving Ground (YPG) for more than two years, most recently to verify software updates in the flight control software that have been made as a result of this testing.

“This iteration of testing is somewhat of a culmination exercise for the team,” said Joshua Magana, test officer. “After this, the program will go into an initial operation test and evaluation training period that will train the pilots, aircrew and maintainers who support will support the initial operational testing next spring.”

YPG’s DVE course is highly coveted by helicopter testers seeking to protect flight crews from the potentially catastrophic consequences of brownouts. Caused by rapidly blowing sand and dirt thrown into a vortex by the rotor blades of a helicopter, a brownout’s swirling dust gives pilots the illusion they are moving even if they are hovering stationary. Hazardous in any situation, it is particularly risky when landing in a combat zone with multiple other aircraft, or in a situation where support personnel are on the ground below. The risk is compounded when the aircraft is hauling an extremely heavy cargo load beneath it.

The extremely fine “moon dust” on YPG’s DVE course, tilled for maximum

diffusion when a helicopter hovers overhead, was more than adequately harsh for the testers’ purposes—YPG personnel prepared the site in such a way to ensure a variety of DVE conditions, diskings the dusty ground at depths of 2 and 8 inches while leaving other areas of the site completely untilled.

“If they flew at one end of the course, it was as bad a DVE as it can possibly get,” Magana said. “If they flew on the other end, it was significantly less severe.”

The King Stallion’s primary mission is assault support, and testers put it through its paces at the DVE in extremely realistic scenarios that included support from Marine Wing Support Squadron (MWSS) 371 based at Marine Corps Air Station-Yuma. The Marines attached and unhooked massive blocks of standardized weights ranging between 6 and 13.5 tons as the CH-53K traversed the DVE course, day and night.

“It’s meant to simulate everything from a Joint Light Tactical Vehicle to a Light Armored Vehicle,” Magana said. “The air-

‘Wake Island Avengers’ Take F-35Bs to England

U.S. Marine Corps photo by 1st Lt. Zachary



Five F-35B Lightning II aircraft with Marine Fighter Attack Squadron (VMFA) 211, Marine Aircraft Group 13, 3rd Marine Aircraft Wing, taxi at Royal Air Force Station Marham, United Kingdom, Sept. 3.

ROYAL AIR FORCE BASE MARHAM, England—Marine Fighter Attack Squadron (VMFA) 211 deployed for training to Royal Air Force (RAF) Marham, England, Sept. 3. Pilots from the “Wake Island Avengers” flew more than six F-35B Lightning II aircraft from Marine Corps Air Station (MCAS)

Yuma, Arizona, to MCAS Beaufort, South Carolina, and then on to RAF Marham.

VMFA-211 is training with U.K.’s 617 Squadron at Marham in preparation for next year’s inaugural, global deployment onboard HMS Queen Elizabeth as part of Carrier Strike Group (CSG) 21.



The CH-53K has undergone extensive developmental testing that utilized the degraded visual environment test course at U.S. Army Yuma Proving Ground for more than two years, most recently to verify updates in the flight control software.

U.S. Army photo

craft is made to carry externally anything up to 36,000 pounds, unhook it and get out of there.”

Aircraft refueling at YPG typically is only done “cold,” or with the aircraft’s engines off and powered down, as a safety measure. To maintain maximum realism for test purposes and increase the efficiency of the test, however, a waiver was granted to allow for “hot” refueling of the aircraft. MWSS-371 established a

forward arming and refueling point on an improved airstrip close to the DVE site.

“The testers received test efficiency, and MWSS-371 received training on refueling this new aircraft in an operationally realistic environment,” Magana said. “It was a win-win that integrated training with our developmental test.”

The large-scale test that began its planning phase in early 2020 proceeded without delay despite the arrival of the

COVID-19 pandemic a mere weeks after formal coordination began.

“The program’s schedule didn’t slip at all,” Magana said. “The customer had implemented strict COVID-19 procedures for their personnel prior to coming here and after arriving, and followed all of YPG’s procedures once they were here.”

Written by Mark Schauer, editor of “The Outpost,” a publication of the U.S. Army Yuma Proving Ground. 🦅

“During this training we will conduct realistic, relevant training to validate our digital interoperability and joint tactics, techniques and procedures,” said Lt. Col. Joseph Freshour, VMFA-211 Commanding Officer. “The Wake Island Avengers will work tirelessly alongside Squadron 617 to develop and hone our mission skills to deploy as a combined naval force. The U.S. Marine Corps has a longstanding special relationship with the Royal Navy and the Royal Marines. We work closely with our British allies to make sure we can work and fight side by side in any clime and place.”

Conducting realistic and relevant exercises such as a deployment for training (DFT) is essential to maintaining readiness and lethality. For two months, VMFA-211 will participate in NATO exercise Point Blank, train with the HMS Queen Elizabeth and participate in Exercise Crimson Warrior. The Wake Island Avengers, Royal Navy and RAF will integrate throughout training, validating the services ability to operate jointly and seamlessly with regard to aircraft carrier operations and maritime power projection.

“It has been a busy three months for the Wake Island Avengers,” Freshour, said. “COVID-19 presented a unique

challenge but didn’t stop the Marines from dominating a recent joint exercise in Nevada, packing more than 240,000 pounds of equipment and stepping off for this DFT. I am proud of the Marines and looking forward to participating in the special relationship our service has with the Royal Navy and Royal Air Force.”

Before the DFT commenced, all Marines, Sailors and civilians assigned to VMFA-211 conducted a two-week restriction of movement (ROM) period at MCAS Yuma. Additionally, every member of the squadron was tested twice for COVID-19, first at the start of the ROM and again before departure. All hands trained and prepared for the movement while following COVID-19 procedures, such as practicing social distancing and wearing face masks or coverings.

While serving as part of a U.K. Carrier Strike Group, VMFA-211 will utilize innovative strategies to combine efforts and resources while collaborating on complex mission sets to maintain our nations’ global maritime military advantage.

Written by 1st Lt. Zachary Bodner, 3rd Marine Aircraft Wing. 🦅

Super Hornet Demonstrates Ski Jump Launch



U.S. Navy photo by Erik Hildebrandt

An F/A-18 Super Hornet successfully completes a ski jump launch demonstration for the first time on Aug. 13 at Naval Air Station Patuxent River, Md.

PATUXENT RIVER, Md.—An F/A-18 Super Hornet recently completed a take-off from a ski jump ramp during a demonstration at Naval Air Station (NAS) Patuxent River, Maryland.

The Indian Navy has expressed interest in potentially purchasing Super Hornets and the demonstration was completed to ensure the jets could launch from the Indians' aircraft carriers, configured with Short Take-Off but Arrested Recovery (STOBAR), commonly referred to as a ski jump.

The extensive planning and day-to-day coordination between the F/A-18 & EA-18G Program Office International Business and Test and Evaluation (T&E) teams, Air Test and Evaluation Squadron (VX) 23, and aircraft manufacturer, The Boeing Company, resulted in a series of test events late this summer demonstrating the capability in a variety of load configurations.

The program office T&E Lead, Jackie Dvorak, credited the Navy-Boeing collaboration and the expertise of the supporting test team for continually adjusting to make the demo successful.

“The India ski jump demonstration is exactly what we do in developmental flight test with mitigating risk through extensive and detailed test planning and safe execution,” she said.

The supporting team worked with Boeing's simulation data and information gleaned from previous ski jumps conducted with the F/A-18 Hornet and F-35B Lightning II to develop an Interim Flight Test Clearance. They identified a suitable test jet and instrumented it to capture data in real-time and completed multiple test events.

The team also hosted Deputy Assistant Secretary of the Navy for International Program Rear Adm. Frank Morley and representatives from the Indian Embassy, who watched a ski jump launch flight test in-person, toured the aircraft and were briefed on the potential sale of Super Hornets to the Indian Navy. India's fighter jet procurement decision is anticipated as early as next year.

Written by Carrie Munn, F/A-18 and EA-18G Program Office Communications. 🇺🇸

Tom Cruise, Jerry Bruckheimer Named 'Honorary Naval Aviators'

SAN DIEGO, Calif.—Film producer Jerry Bruckheimer and actor Tom Cruise became the Navy's 35th and 36th Honorary Naval Aviators, respectively, during a brief ceremony held at Paramount Studios in Los Angeles on Sept. 24.

The designations were presented by Commander, Naval Air Forces, Vice Adm. DeWolfe Miller III, prior to a screening of "Top Gun: Maverick," which is scheduled to premiere on July 2, 2021. As honorary naval aviators, Bruckheimer and Cruise are authorized to wear the "wings of gold" of a U.S. naval aviator and are entitled to all honors, courtesies and privileges afforded to naval aviators.

The citation for the award stated "In the history of motion pictures, there is not a more iconic aviation movie than the 1986 Paramount Pictures film 'Top Gun.' Its characters, dialogue and imagery are ingrained in the minds of an en-

tire generation of Americans. The movie captured the hearts of millions, making a profound positive impact on recruiting for Naval Aviation," and "significantly promoted and supported Naval Aviation and put aircraft carriers and naval aircraft into popular culture."

The citation went on to say that Cruise and Bruckheimer made great efforts to "ensure the 'Top Gun' franchise is as authentic as possible, staying true to the unparalleled tactical excellence of the Navy Fighter Weapons School, the ethos of Naval Aviation, and the fighting spirit of the men and women of the world's greatest Navy."

The distinction of honorary naval aviator has not been bestowed in more than two years. Previous designees include Bob Hope in 1986 for his contributions to the morale of the Naval Aviation community, Jim Nabors in 2010 for his support of the Pacific Aviation Museum

and contributions to the morale of service members in his on-screen role as U.S. Marine, Pvt. Gomer Pyle, and Susan Ford Bales in 2016 for her role as ship's sponsor for aircraft carrier USS Gerald R. Ford (CVN 78).

In "Top Gun: Maverick," Cruise is reprising the iconic role of Navy pilot Pete "Maverick" Mitchell. Bruckheimer produced both films, with "Top Gun" grossing more than \$350 million at the box office worldwide and influencing an entire generation of naval aviators.

The "Top Gun" movie franchise is named for the U.S. Navy's Fighter Weapons School, also known as "TOP-GUN," based at Naval Air Station Fallon, Nevada, which provides advanced tactics training for Navy and Marine Corps aviators.

From Commander, Naval Air Forces Public Affairs. 🦅



U.S. Navy photo by Alex J. Berliner

Vice Adm. DeWolfe H. Miller III, Commander, U.S. Naval Air Forces, presents Honorary Naval Aviator designations to actor Tom Cruise, on screen, and film producer Jerry Bruckheimer in recognition of their significant and continuous support of Naval Aviation throughout the production of films "Top Gun" and "Top Gun: Maverick" on Sept. 24.

FORD WELCOMES CARRIER AIR WING 8

HITS 4,000TH LAUNCH AND RECOVERY

Compiled by Rob Perry

Editor's Note: As summer transitioned into fall, the Navy's latest and most advanced aircraft carrier, USS Gerald R. Ford (CVN 78), continued to reach milestones on its way to deployment, including completing its 11th independent steaming event (ISE); officially welcoming its Carrier Strike Group, CSG-12; and reaching its 4,000th launch and recovery with its state-of-the-art systems in the Atlantic Ocean.

Ford is currently underway in the Atlantic Ocean conducting ISE 13 of 18, as part of the ship's Post-Delivery Test and Trials (PDT&T) phase, scheduled to continue through mid-2021.

Navy's Most Advanced Carrier Steams Ahead

USS Gerald R. Ford (CVN 78) completed independent steaming event (ISE) 12 on Oct. 2 and is now more than halfway through her Post-Delivery Test and Trials (PDT&T) phase of operations. Ford completed many major PDT&T milestones designed to exercise installed systems and conduct crew training including: qualifying 19 pilots assigned to the "Gladiators" of Strike Fighter Squadron (VFA) 106 and 21 pilots assigned to the "Greyhawks" of Airborne Command & Control Squadron (VAW) 120. VAW-120 also completed their first carrier qualifications with the aerial refueling variant of the E-2D Advanced Hawkeye.

Ford also conducted many "firsts" and training evolutions, including the Aircraft Intermediate Maintenance Department's full run to afterburner of an F/A-18 jet engine using Jet Engine Test Instrumentation; the Combat Systems Department's pre-action aim calibration fire on one of three close-in weapons system mounts; and the Operations Department's completion of an Air Intercept Control (AIC) event on July 30.

Air Intercept Control Mission Training

AIC missions provided the opportunity to demonstrate integration with CSG-12 as part of the air defense mission



U.S. Navy photo by MC2 Ruben Reed

USS Gerald R. Ford (CVN 78) is underway in the Atlantic Ocean conducting carrier qualifications.

Naval Aircrewman (Tactical Helicopter) 2nd Class Casey Shanahana, assigned to the "Spartans" of Helicopter Maritime Strike Squadron (HSM) 70, participates in deck landing qualifications.

U.S. Navy photo by MCSN Riley McDowell



to defend Ford and the rest of the force and are required to increase the Combat Direction Center's proficiency through training.

Lt. Shane Welsh, the air defense officer for the Ticonderoga-class cruiser USS Leyte Gulf (CG 55) training with Ford's operations team, said the mission was a collaborative effort between Ford and Carrier Air Wing (CVW) 7 and CVW-8.

"The Ford is considered an air defense unit (ADU)," Welsh said. "The Air and Missile Defense Commander (AMDC) assigned Ford the mission to control defensive counter-air assets. If we had other ADUs in the area, the AMDC would coordinate with them and would report information to the battle watch in the Tactical Flag Command Center."

Ford's Air Intercept Controller, Operations Specialist 1st Class David Geary, controlled two separate AIC events. Both were defensive counter-air missions designed to protect a



An E-2D Advanced Hawkeye, assigned to the "Greyhawks" of Airborne Command & Control Squadron (VAW) 120, prepares to land on Ford's flight deck.

U.S. Navy photo by MC3 Zachary Melvin



U.S. Navy photo by MCSN Riley McDowell

Operations Specialist 1st Class David Geary, an air intercept controller, stands watch at a console inside Ford's Combat Direction Center during an aircraft intercept control exercise.



U.S. Navy photo by MC2 Ryan Seelbach

An F/A-18F Super Hornet, attached to the "Gladiators" of Strike Fighter Squadron (VFA) 106, prepares to land on Ford's flight deck.

high-value asset against several waves of "red air" threats. First were two F/A-18E Super Hornets, attached to the "Jolly Rogers" of VFA-103, followed by four F/A-18F Super Hornets from the VFA-213 "Black Lions." Despite being outnumbered by the threat, the Jolly Rogers and Black Lions integrated with Ford's AIC and employed U.S. Navy Strike Fighter Tactics Instructor Program (TOPGUN) recommendations to successfully defend Ford.

"We were simulating an air defense scenario," Geary said. "We were controlling the fighter to intercept, escort and if necessary kill the inbound threat aircraft."

The AIC is the third wingman in the fighter community. The AIC's job is to paint a mental picture for the pilots in the air via voice and data link communication.

"I am in voice communication with all the fighters," Geary said. "As the fighters and threats close, I must put together a specific

timeline to ensure they have the best situational awareness possible to enhance lethality and increase survivability."

"It was an excellent event," Welsh said. "It's a new ship, new crew, new strike group. Getting that continuity together where it's all second nature, that's what's important."

Working behind the scenes, Ford's Engineering and Weapons Departments ensured the safety of the crew and embarked Sailors with advanced hands-on damage control training for more than 180 personnel over a 12-day period, and the qualification of 30 Sailors on the .50-caliber machine gun.

CVW-8 Officially Joins CSG-12

CVW-8 officially joined CSG-12 Aug. 21. CVW-8, known as "Factory," joined the Ford, nicknamed "Wolverine," Destroyer Squadron Two, USS Leyte Gulf (CG 55) and USS Gettysburg (CG 64), to complete CSG-12.

Ford logged its 4,000th trap (arrested landing) Sept. 10 with Training Air Wing 2 during carrier qualifications.



U.S. Navy photo



A C-2A Greyhound, attached to the "Rawhides" of Fleet Logistics Support Squadron (VRC) 40, taxis on Ford's flight deck.

During ISE 9A in February, the Factory-Wolverine team completed initial flight deck and carrier air traffic control center certifications aboard Ford. In May, Ford hosted CVW-8 on the first air wing embark, which for the first time utilized the advanced weapons elevators to deliver heavy inert ordnance from the aft magazine to the flight deck. Those weapons were then loaded by CVW-8 Sailors in coordination with the Ford's Weapons Department and expended from F/A-18E/F Super Hornets over the Navy Dare Bombing Range.

"The Ford and Carrier Air Wing 8 teams made incredible strides forward for the Naval Aviation Enterprise demonstrating a level of professional competence that rival her peers," said Capt. Josh Sager, Commander, CVW-8. "I truly look forward to working with CSG-12 to make Ford deployment-ready."

CVW-8 consists of seven aircraft squadrons flying F/A-18E/F



U.S. Navy photo by MCSN Riley McDowell

An MH-60R Seahawk helicopter, attached to HSM-70, hovers over the fantail of the guided-missile destroyer USS Arleigh Burke (DDG 51) during deck landing qualifications.

Super Hornets, E-2C Hawkeyes and MH-60R/S Seahawks and more than 1,500 personnel.

HSM-70 Assumes Logistics Role

The "Spartans" of Helicopter Maritime Strike Squadron (HSM) 70, attached to CVW-8, began working hand-in-hand with Ford during September as Ford commenced ISE 12, continuing the ship's 18-month PDT&T phase of operations.

The Spartans have been helping to fulfill the logistic requirements of Ford and have been the alert plane guard search-and-rescue asset during fixed-wing operations. Ford serves as a platform for HSM-70's pilots to receive training on all their mission requirements, but especially the more junior members of the squadron. Many of these junior pilots are working from a ship for the first time.

"It's definitely intimidating at the beginning, showing up knowing you have this big syllabus to get through in order to



An F/A-18 Super Hornet performs a fly-by of CVN-78.

U.S. Navy photo by MCSA Trenton Edly



U.S. Navy photo by MC3 Zachary Melvin

A Sailor assigned to Ford's Air Department waits to launch an E-2D Advanced Hawkeye assigned to VAW-120.

reach our goals," said Lt. j.g. P.J. Oristian, a junior pilot assigned to HSM-70. "When we show up, our first goal is to make helicopter aircraft commander or what we call HAC."

HSM squadrons act as a jack-of-all-trades within the air wing, focusing primarily on anti-submarine warfare (ASW), surface warfare and electronic warfare. The MH-60R helicopter, flown by HSM-70 pilots, has command and control capabilities as well.

"HSM within the air wing is really growing," said Lt. Cmdr. Joey "Queen" Kühn, the detachment's officer in charge. "The world is developing into this near-peer competition, where we are coming back to an open ocean fight, and HSM in general is starting to take a premiere role in that fight."

While HSM-70 is in a maintenance phase of operations with one detachment deployed with the Arleigh Burke-class guided-missile destroyer USS Winston S. Churchill (DDG 81), they

have pushed farther into the ASW mission to protect aircraft carriers and serve as an organic ASW asset for the strike group.

"We can go out and be the eyes and ears of the strike group, to help with long-range targeting or the basic task of identifying who is around us," Kühn said.

While underway, HSM-70 had the opportunity to further integrate strike group operations with the guided-missile destroyer USS Arleigh Burke (DDG 51) on Sept. 5. Ford and Arleigh Burke steamed within range for junior pilots assigned to HSM-70 to complete deck landing qualifications and conduct a vertical replenishment.

"Those are experiences these pilots won't get everywhere," Kühn said. "They are valuable experiences as future helicopter aircraft commanders because at the end of the day those are the pilots that are going to replace us old guys."

EMALS and AAG Hit 4,000 Aircraft Recoveries, Launches

Ford logged its 4,000th aircraft launch and recovery on Sept. 10, showcasing the performance capabilities of the ship's Electromagnetic Aircraft Launch System (EMALS) and Advanced Arresting Gear (AAG).

Capt. Kenneth Sterbenz, Aircraft Launch and Recovery Equipment (ALRE) Program manager, noted the milestone is a significant achievement for both the program and Ford crew.

"EMALS and AAG are consistently performing as expected and standing up to the rigorous testing of PDT&T operations," Sterbenz said. "Reaching 4,000 launches and recoveries is not only an important performance datapoint, but it also represents years of technological development and the dedication, professionalism and successful work put forth by the ALRE team and CVN-78."

EMALS and AAG provide significant technological advancements to the Navy's Ford-class aircraft carriers, requiring a smaller footprint aboard the ship, less maintenance and less manpower than comparable steam catapults and arresting gear aboard Nimitz-class carriers.

Shannon Coulter, assistant program manager for ALRE systems engineering, has been aboard Ford for every fixed-wing launch and recovery since the first in 2017.

"It's been incredibly rewarding for our team to watch AAG and EMALS mature over the past nine months, as Ford's crew gains significant experience and increased confidence with maintenance and operations," Coulter said. "The NAVAIR and General Atomics programmatic, engineering, maintenance and logistics team has done an absolutely outstanding job of supporting CVN-78 over the past 4,000 EMALS and AAG launches and recoveries, and we look forward to strong system performance throughout the remaining PDT&T events."

Rob Perry is a staff writer/editor for Naval Aviation News. Compiled from articles written by Mass Communication Specialists 2nd Class Ryan Seelbach, Seaman Riley McDowell and Lt. j.g. Ayifa Brooks with USS Gerald R. Ford Public Affairs and Kristin Beauchamp with Aircraft Launch and Recovery Equipment Program Communications. 🦅

Super Blue

Tricked and Flipped Out

First F/A-18E Modified, Tested, Ready for Blue Angels

By Rob Perry



A promise made several years ago to the Blue Angels came closer to fruition this summer as the first F/A-18E Super Hornet designated to replace the Navy Flight Demonstration Squadron's (NFDS) F/A-18 Legacy Hornets arrived for upgrades and testing at Naval Air Station (NAS) Patuxent River, Maryland.

Dubbed the "Super Blue," the F/A-18E is the first of 18 Super Hornets scheduled to be delivered by the end of the year in time for the 2021 Blue Angels air show season, slated to begin in April.

The 2020 air shows were cancelled in accordance with Navy and CDC guidelines brought on by the COVID-19 global pandemic.

Since 2015, the Navy has been analyzing how to upgrade the Blue Angels to the Super Hornet while balancing fleet readiness. An in-depth study of aircraft systems and flight characteristics was conducted beginning in December 2017. At the same time, to ensure a safe transition from the Hornet to the Super Hornet, the Blue Angels developed a new demonstration routine tailored to the F/A-18E/F as well as undertook a comprehensive risk and airframe fatigue reduction effort.

The Super Hornet replacement of the Legacy Hornet is expected to improve safety margins, reduce aircraft

fatigue and require less maintenance. In many other ways, the Super Hornet offers improved performance—it has more thrust available, especially at low altitudes, enabling tighter turns and faster acceleration for some maneuvers, and offers better vertical and looping performance.

Out of Storage, Into the Skies

In order to prepare the Super Hornet to perform maneuvers and stunts that have made the Blue Angels famous, it first had to undergo alterations and testing, some of which were performed by engineers and pilots with Air Test and Evaluation Squadron (VX) 23 at NAS Patuxent River.

The Super Blue started its journey at Cecil Field, Florida, where it was taken out of preservation and modified, which included installation of an artificial feel spring for the control stick, a stopwatch, smoke and fuel pump switches and fuel pressure warning lights in the cockpit;



Air Test & Evaluation Squadron (VX) 23 conducts flight testing of the first "Super Blue" for the Navy Flight Demonstration Squadron this summer.

U.S. Navy photo illustration by Fred Fierlage; photographic image by MC2 Cody Hendrix

U.S. Navy photo

an inverted fuel pump system; and the removal of the aircraft's standard M61 cannon, replaced by the smoke system used to create trails during airshow demonstrations. Additionally, a software load unique to Blue Angels aircraft was installed.

The aircraft arrived at Patuxent River in May and upgrades to the fuel system and flight testing were completed in early August.

"After a few weeks of maintenance repairs and instrumentation of the aircraft, we began testing at the end of June," said Lt. Sean "Daywalker" Cawley, flight test officer with VX-23. "The aircraft we were testing hadn't flown in nine years, so it had some maintenance quirks that our awesome maintenance department solved, and they got the jet in great working order. During testing, the aircraft handled just like any other Super Hornet would. The only differences apparent to the pilot are the Blue Angels' cockpit modifications."

The inverted fuel pumps are necessary modifications to the stunt aircraft, allowing the jet to remain overturned for a prolonged period. VX-23 head project engineer Kris Haines said Blue Angels' inverted maneuvers exceed normal limits, necessitating the fuel system modification. The fuel system upgrades to the Super Hornet are very similar to those made to the Legacy Hornets, which include using the same fuel pumps and activation switch.

"The Blue Angels fuel system modification consists of an electric fuel pump installed at the top of each engine's feed tank," Haines said. "The Super Hornet feed tanks integrate an inverted flight compartment at the bottom of the tank to trap fuel used by the production fuel pump during negative-G maneuvers. The [modified and installed] Blue Angels electric fuel pumps, activated by the pilot during inverted flight, pump fuel into the

inverted fuel compartment of each feed tank to then be used by the production fuel pump in supplying each engine with continuous fuel during the extended duration inverted maneuvers."

An additional alteration to the aircraft's landing gear was required for extended inverted flight.

"The landing gear struts have to be over-serviced so that during inverted flight, the gear stays extended," Cawley said. "Otherwise, the heavy gear would fall under their own weight and air loads and set a weight-on-wheels condition which drastically changes the response of the flight controls if the jet thinks it is on the ground," Cawley said.

Taking Her Out for A Spin

The Super Blue was delivered for testing to NAS Pax River due to the presence of VX-23, but also because the base is

FRCSE Paints, Maintains, Modifies Super Blues

By Ashley Lombardo



U.S. Navy photo

Fleet Readiness Center Southeast painted the inaugural "Super Blue" for the Blue Angels.

Fleet Readiness Center Southeast (FRCSE) recently applied the final coat of paint on the inaugural F/A-18 Super Hornet for the U.S. Navy's Flight Demonstration Squadron, the Blue Angels.

The aircraft's distinctive paint, cobalt blue with yellow trim, is just the work completed by the depot that the eye can see. FRCSE also performs maintenance and modifications that range from the removal of weapons systems to the outfitting of each aircraft with a

control stick spring system for more precise aircraft control.

The team's transition from the F/A-18 Hornet to the F/A-18 Super Hornet, a more powerful jet that's approximately 25 percent larger, would not be possible without FRCSE. The Legacy Hornet has served as the primary aircraft for the Blue Angels since 1986 and will be retired in 2021.

"Knowing we are playing a critical role in making the Super



U.S. Navy photo

home to the U.S. Naval Test Pilot School (USNTPS), where experienced Navy pilots undergo an intense 11-month course.

While at USNTPS, students fly a large stable of aircraft and perform qualitative evaluation flights on aircraft brought to the school house, Cawley said. Prior

to training at USNTPS, prospective students must have spent time deployed with a fleet squadron. Test pilots who flew the Super Blue at VX-23 were deployed with F/A-18 squadrons prior to USNTPS training, a trait that Blue Angels pilots also share, “and are very com-

fortable getting back into the aircraft,” Cawley said.

“VX-23 test pilots and Blue Angels pilots have a strong tactical and professional background to get to these competitive follow-on tours. Obviously, after leaving those tours, each of us receive

Hornets ready for the team is an incredibly proud moment for the command as a whole,” said Col. Fred Schenk, FRCSE’s Commanding Officer. “The work is ongoing, and we’re tremendously honored to be a part of the transition. We aren’t just providing the well-known Blue Angels paint scheme, but we are performing the necessary maintenance and modifications to sustain the aircraft throughout their service life with the team.”

According to Rick Heffner, FRCSE’s paint shop supervisor, the depot has been applying the Blue Angel’s signature paint for years, but when the demonstration squadron decided to transition to the Super Hornet aircraft, Heffner and his team had their work cut out for them.

“It was decided last year that FRCSE would continue to provide this service for the new airframe. The Super Hornet is larger than the Legacy Hornet, so getting the proper size markings for the aircraft was a challenge initially,” Heffner said.

The painting process for these aircraft takes approximately 10 days. It’s a job that requires a significant amount of prep work, which includes sanding, washing, masking, priming and seam-sealing before applying the blue, yellow, white and clear paint coats and accents. Each process requires a keen eye for detail and meticulous time management.

Matt Lindberg, FRCSE’s deputy director of the F/A-18E/F MRO Production Line, said the first Super Hornet slated for conversion arrived at Cecil Commerce Center in December 2017 and work is expected to continue throughout 2021.

“FRCSE is performing the planned maintenance interval (PMI), modifications (MODs) and other over and above work to get these jets ready for years of uninterrupted service by the Blue Angels. A couple of the jets were in storage for five to six years, so we had to bring them back up to code,” he said. “The work we do can take anywhere from 90 days to a year, depending on the condition of the jet and work package requirements.”

Once the aircraft arrives at Cecil, it goes through the same basic life cycle: PMI, MODs and is then towed to the main facility at Naval Air Station (NAS) Jacksonville for paint strip and prime. Boeing then completes Blue Angel-specific modifications such as the addition of an oil tank for the smoke generation system before returning the aircraft to NAS Jacksonville for final paint. Lastly, Boeing finalizes the assembly and performs flight tests.

To date, FRCSE has performed PMI or MODs on nine of the first 11 Super Hornet aircraft slated for the Blue Angels.

“As a team, we take a tremendous amount of pride in the work we’ve completed and continue to do in support of the new platform for the Blue Angels. Every day our employees strive to maximize their performance to produce quality products at an ever-increasing speed,” Lindberg said.

“I can confidently speak for the rest of our team when I say we cannot wait to see the jets we have worked diligently on take to the skies in cities around the United States.”

Ashley Lombardo is a public affairs specialist with Fleet Readiness Center Southeast Public Affairs Office. 🇺🇸



U.S. Navy photo by MC2 Christopher Gordon

Capt. Eric Doyle, director of the Blue Angels Super Hornet Transition Team, departs the Boeing facility at Cecil Field in Jacksonville, Fla., for Naval Air Station Pensacola in the first Blue Angels F/A-18 Super Hornet, July 27.

more specialized training to prepare us for our next jobs, be it a year at USNTPS or the Blues training work-up program for their new pilots.”

Although VX-23 test pilots and engineers routinely qualify a variety of aircraft for performance and are adept

with the flying qualities of the F/A-18, testing the Super Blue was different.

“The maneuvers evaluated for the NFDS included some things that are outside the normal aircraft operating manual and outside normal fleet maneuvers,” Cawley said. “The things you see

in the airshows such as the dirty roll—an aileron roll [a 360-degree roll along the longitudinal axis of the aircraft] performed with the landing gear down shortly after takeoff—are absolutely something reserved specifically for airshows, but with the NFDS retiring their

Blue Angels’ ‘New’ C-130J Delivered

By Valerie Doster

Through a combined effort between the U.S. Navy, the United Kingdom Ministry of Defence (U.K. MoD) and the Tactical Airlift Program Office, the Navy Flight Demonstration Squadron (NFDS), received a revamped C-130J Super Hercules logistics aircraft on Aug. 4.

The aircraft, purchased from the U.K. MoD in June 2019, underwent year-long refresh, turning the aircraft into the beloved logistics and transport aircraft used by the Blue Angels.

The program office and U.K. MoD co-managed the refurbishment, working through a Ministry of Defence contract. All efforts were performed at Marshall Aerospace and Defense Group (ADG) in Cambridge, England.

“The teams were united in the one task, to meet the needs of the fleet,” said Capt. Steve Nassau, Tactical Airlift Program manager. “The return of an organic-based logistics aircraft to the Blue Angels squadron has freed up much needed assets being utilized temporarily to meet the NFDS mission needs. Thank you to everyone across the NAVAIR enterprise and across the ocean who assisted in this delivery.”

The newly acquired “J-Model” Super Hercules completes the NFDS transition from the previous legacy C-130T Hercules, which the squadron used for 17 years and retired in May 2019. While the C-130J will be the only variant of its type used by the Navy, the C-130J is

familiar to the U.S. Air Force and shares common components with the KC-130J currently flown by the Marine Corps.

“It required a collaborative effort between NAVAIR engineering and Lockheed Martin to identify configuration deltas and test requirements,” said Jack Miller, Airframes Integrated Program Team lead. “These efforts were done to meet U.S. and FAA requirements and included a major rework inspection, hardware and software configuration changes, and ground and flight testing. The teams were also assisted by the C/KC-130 Fleet Readiness Center Team at Cherry Point, North Carolina, which created the reconfiguration plan.”

Additionally, detailed work, spanning across the NAVAIR enterprise, had to go on behind the scenes to ensure the squadron’s safe operation, and its ability to support and maintain a new type-model aircraft. Administrators built aircraft logbooks from U.K. MoD formatted information. NAVAIR engineers and logisticians reviewed and updated maintenance publications and procedures. NAVSUP personnel worked with the squadron and base supply officers to understand proper provisioning. The support equipment team identified C-130J specific support equipment and delivered it to the NFDS. This required routine communication between personnel from the program office, Center of Naval Aviation Training (CNATRA)

Hornets, it was our job to ensure that that maneuver and others in the Blues' show can be safely performed in the Super Hornet as well."

In all, the Super Blue went through the same testing routines that the Legacy Hornets were put through to qualify for Blue Angels shows.

"Some of this testing included aircraft envelope expansion to allow the Blues to fly with the landing gear extended faster than we normally can, fly inverted with the landing gear down and execute consecutive aileron rolls," Cawley said. "The aircraft flying qualities were evaluated with the artificial feel spring that the Blues use and we also did some performance evaluations for take-offs with the flaps up. [The spring] is attachable to

the control stick [and] provides constant forward force on the stick. The Blue Angels pilots use this to help them fly more precisely in close formation."

Cawley also explained that combat flight profiles and Blue Angels profiles are somewhat different in that the aircraft fly in much closer formations than typical for the stunt shows.

"Blue Angels flight profiles involve a lot of practice and working up to flying as close as they do during their shows," he said. "Fleet aviators typically only fly in close formation when flying together through clouds or returning to base after a flight. Most fleet formation flying is further apart to facilitate greater pilot attention to their own aircraft sensors and the fight rather than the 100-percent

dedicated attention to close formation flying required of any extremely close formation. Both combat and NFDS shows require intense preparation, solid teamwork and trust between the pilots."

VX-23 pilots usually test aircraft with different load outs, including extra fuel tanks and ordnance, but Blue Angels aircraft are completely stripped down, called a "slick" load out, with no external fuel tanks and all weapons pylons removed.

During testing, Cawley said, one typical pilot accompaniment tended to be a nuisance during lower speed inverted flight: the helmet bag.

"Fleet pilots rarely fly inverted at less than 1G," Cawley said. "While they may be inverted during combat maneuvering,



C-130 pilots and crew assigned to the U.S. Navy Flight Demonstration Squadron, the Blue Angels, pose with the team's newly acquired C-130J Super Hercules in Cambridge, England, on June 6.

and the NFDS to ensure proper adherence to the Naval Aviation Maintenance Program.

The refresh was not without its challenges. Teams on both sides of the ocean overcame several issues, including international travel restrictions, mandatory teleworking and social distancing restrictions brought on by the COVID-19 global pandemic. Without NAVAIR on-site engineering support, the teams had to overcome time zone differences, communicating primarily through phone, email and Skype to prevent delays.

"The aircraft was about to receive its final paint when the world-

wide pandemic hit in full," Miller said. "With an ocean between us, shipping parts, team members and equipment overseas was a challenge. Working during a pandemic had our teams executing creative ways to reconstruct a way forward. Marshall ADG implemented safe ways to proceed with the repairs and paint, including working with flight and maintenance crews to complete testing. The NFDS crews endured 14 days of quarantine before actually being able to run the aircraft through its tests. Kudos to everyone on their flexibility and determination to get the job done right."

Valerie Doster supports Tactical Airlift Program Communications. ✈



The first Blue Angels F/A-18 Super Hornet parks on the flight line at Naval Air Station Pensacola, Fla.

U.S. Navy photo by MC2 Cody Hendrix

it's usually under positive Gs. Fleet aviators typically fly with a helmet bag stuffed on the right side of the cockpit that will have checklists, instrument approach plates and various other things, so any time you fly inverted at -1G, that bag has a horrible habit of flying up, hitting the top of the canopy and sliding back to where we can't reach it. When we flew the tests to evaluate the fuel system for the extended inverted time, the test pilots didn't bring the helmet bag and just brought the checklist which is small enough to be stowed."

In addition to Haines and members of the fuel systems evaluation team, a test conductor and additional engineers monitored the aircraft's test parameters, which were sent to a control room from the cockpit. The test team monitored fuel pressure, fuel quantities and valve positions to ensure the system was working as designed.

"The testing validated the modification's ability to provide sufficient fuel to the engines under inverted flight longer than the aircraft was designed," Cawley

said. "No dangerous drops in feed tank fuel quantity or fuel pressure were seen."

All Super Hornets with the same modifications for the NFDS do not require additional testing, Cawley said. Once testing was completed at NAS Pax River, the Super Blue returned to Cecil Field for additional modifications and to receive its signature Blue Angels paint job (*see article on page 30*).

While it remains to be seen whether aviation enthusiasts will see the fruits of this labor in 2021, COVID-19 protocols did remain in place during upgrades and testing but did little to hamper deadlines.

"While much of the flight test planning and coordination of testing assets were conducted via telework situations, the actual flight test execution required on-site participation," Haines said. "In all, the COVID work climate had little impact on the overall test program, which was completed on schedule to support the Super Blue transition."

"As I'm sure many people have seen through this time, a lot of work can successfully be done while teleworking using various conferencing systems, but communication in general is difficult and the additional hurdles didn't help," Cawley said. "However, the pros at VX-23 worked hard and finished the fuel system evaluation on schedule."

Rob Perry is editor and staff writer for Naval Aviation News. ✈️



Lt. Sean "Daywalker" Cawley, flight test officer with VX-23, coordinated and conducted flight tests of the Blue Angels' Super Blue this summer.

U.S. Navy photo by Paul Lagasse

The U.S. Naval Test Pilot School educates the **WORLD'S FINEST** developmental test pilots, flight officers, and engineers in the design, risk management, execution, and communication of aircraft and systems testing.

**APPLY TODAY!
SEATS ARE LIMITED**

REACHING

FLIGHT



UNITED STATES NAVAL TEST PILOT SCHOOL

USNTPS

USNTPS OFFERS CURRICULA IN:

- Fixed Wing
- Rotary Wing
- Airborne/Unmanned Systems (NFO)

HOW TO APPLY

SUBMIT YOUR APPLICATION:

Navy Personnel Command
www.public.navy.mil/bupers-npc
Click on Boards - Administrative - Test Pilot

Mark These Dates on Your 2021 Calendar

June Selection Board for January Class

- Application announcement Issued: March/April
- Applications accepted: Up to mid-May
- Board convenes: Mid June
- Results posted: Early July

Expected arrival dates for pre-arrival training:

- Fixed Wing: August 1
- Rotary Wing: November 1
- Systems: December 1

Dates subject to change

For more information on the U.S. Naval Test Pilot School visit: navair.navy.mil/nawcad/usntps



VINSON CONDUCTS FLIGHT DECK CERT WITH FIRST OPERATIONAL F-35C SQUADRON

By Lt. Cmdr. Miranda Williams

USS Carl Vinson (CVN 70) completed several certifications Sept. 17, including flight deck certification (FDC) and carrier air traffic control center (CATCC) certification, after nearly a week of flight deck operations designed to ready the carrier for future operations.



U.S. Navy photo by MC3 Katlyn E. Huska

The underway also marked the first time Carrier Air Wing (CVW) 2 and Vinson, both part of Carrier Strike Group (CSG) 1, fully integrated and operated together since the addition of the F-35C Lightning II.

“The flight deck certification is one of many ways the Navy ensures the safety and readiness of our equipment and personnel,” said Rear Adm. Timothy J. Kott, commander, CSG-1. “The fact that Vinson was able to safely and successfully complete the flight deck certification while operating with the Navy’s first operational F-35 squadron is an exciting bonus.”

FDC is required for the carrier to embark aircraft, the primary weapons system for the platform, and

is designed to provide operational continuity and proficiency training for carrier crews. During FDC, the carrier is evaluated on its ability to launch and recover aircraft in a safe manner in both day and night time operations.

Vinson, along with CVW-2 squadrons, also achieved certification in Precision Approach Landing Systems (PALS), Joint Precision Approach Landing Systems (JPALS) and carrier qualifications for the six fixed-wing squadrons.

“These certifications ensure that Vinson meets the standards, and, in our case, we went above and beyond the certification requirements,” said Capt. Matthew Paradise, Vinson’s Commanding Officer.

Two F-35C Lightning II aircraft, attached to the “Argonauts” of Strike Fighter Squadron (VFA) 147, start engines on the flight deck of Nimitz-class nuclear aircraft carrier USS Carl Vinson (CVN 70).

U.S. Navy photo by MC3 Katlyn E. Huska



An F-35C lands on the flight deck of Carl Vinson during flight deck certification.

U.S. Navy photo by MC3 Haydn N. Smith



An F/A-18E Super Hornet, attached to the "Stingers" of VFA-113, flies over Carl Vinson.

U.S. Navy photo by MC3 Katlyn E. Huska



An F/A-18F Super Hornet, attached to the "Bounty Hunters" of VFA-2, prepares to land aboard Carl Vinson.

U.S. Navy photo by MC3 Katlyn E. Huska



A C-2A Greyhound, attached to the "Providers" of Fleet Logistic Support Squadron (VRC) 30, approaches for landing.

"I'm not surprised we did so well because every day the teamwork I saw demonstrated by the ship's crew and the air wing was fantastic. Their technical expertise, attention to detail and hard work resulted in our successful completion of certifications."

Prior to integrated operations with the air wing, Vinson underwent a 17-month maintenance availability to receive major upgrades in support of fifth-generation aircraft, making Vinson the first aircraft carrier equipped to support both the F-35C Lightning II and CMV-22 Osprey. Upgrades included enhanced jet blast deflectors able to take the increased

heat generated by the F-35C and the addition of the Autonomic Logistics Information System (ALIS), the new computer network that supports the unique maintenance and tactical operations functions of the advanced aircraft.

With its recent modifications, no other weapons system has the responsiveness, endurance, multi-dimensional might, inherent battlespace awareness or command and control capabilities of the Vinson and CVW-2.

Other components of the air wing include three Navy Strike Fighter Squadrons that fly the F/A-



U.S. Navy photo by MC3 Haydn N. Smith

An E-2D Advanced Hawkeye, attached to the “Black Eagles” of Airborne Command & Control Squadron (VAW) 113, lands on the flight deck of Carl Vinson.

18E/F Super Hornet, one Electronic Attack Squadron that operates the EA-18G Growler, Airborne Command & Control Squadron that operates the E-2D Advanced Hawkeye, one Helicopter Maritime Strike Squadron and one Helicopter Sea Combat Squadron.

Through multiplatform integration, CVW-2 will provide fleet commanders the ability to achieve the advantage across multiple domains: air, land, sea and electromagnetic.

Integration between the air wing and ship’s company is crucial to the everyday success of carrier operations. These flight operations take detailed coordination between ship’s company and the air wing squadrons, and flight deck certification was an opportunity to build that relationship.

“In the carrier environment, teamwork is everything,” said Capt. Matt Thrasher, commander, CVW-2. “Our Sailors and aircrew are focused on the task at hand and the path forward to deployment. Our success with the Vinson team is a direct result of the dedication, training and deployment-ready mentality we embrace daily.”

With the flight deck and air traffic control center now fully qualified, Vinson is eligible to perform carrier qualifications for new pilots and other missions to support the fleet.

Next, Vinson will complete a series of additional “work ups” and certifications in preparation for future operational tasking.

In accordance with COVID-19 safety protocols, all embarked personnel completed restriction of movement or COVID-19 testing, as required, prior to the ship’s underway period.

Lt. Cmdr. Miranda Williams is the Public Affairs Officer for USS Carl Vinson (CVN 70). 🦋

Vinson Begins Operational Training Cycle, Changes Homeport



U.S. Navy photo by MC3 Nicholas R. Carter

Sailors assigned to CVN-70 man the rails on the flight deck of the ship when Vinson departed Naval Base Kitsap–Bremerton.

USS Carl Vinson (CVN 70) arrived at Naval Air Station North Island, California, on Sept. 2, concluding the ship’s homeport shift from Bremerton, Washington to San Diego, California.

Vinson departed Bremerton on Aug. 23 to commence sea trials as the final phase in completing a 17-month docking planned incremental availability (DPIA) at Puget Sound Naval Shipyard and Intermediate Maintenance Facility. Upon the conclusion of DPIA, which began Feb. 28, 2019, Vinson returned to the fleet to begin her operational training cycle.

The DPIA included a complete restoration and system retrofit to accommodate F-35C Lightning II mission capabilities, as well as upgrades to combat systems, electrical systems and crew living spaces, and maintenance on the ship’s hull, rudders and shafts.

“I am proud of all of the hard work and dedication shown by the entire crew throughout the DPIA—and particularly with the added challenges we faced during this pandemic,” said Capt. Matthew Paradise, Vinson’s Commanding Officer. “Also, a huge thank you to our family and friends; because our success was, in large part, due to their unwavering support. We just couldn’t have done this without them.”

Prior to its departure, Vinson conducted extensive COVID-19 prevention measures to ensure the health and safety of the crew while at sea, and to prevent potential spread to their families and the community upon their return to port. Those measures included: restriction of movement for all personnel for 14 days prior to embarking the ship, mandatory face coverings, continued cleaning and disinfecting throughout common areas, routine COVID-19 testing and social distancing.

— Lt. Cmdr. Miranda Williams 🦋

NEW OPERATING PROCEDURES TO MITIGATE

By Andrea Watters

Naval Aviation's operating instruction has been updated with information to help aviators not only mitigate but avoid physiological episodes—Naval Aviation's No. 1 safety priority.

Physiological episodes (PEs) occur when aircrew experience physiological symptoms such as dizziness or cognitive degradation which may impair their ability to perform cockpit duties.

The Physiological Episodes Action Team (PEAT) has incorporated what they've learned in the "General Flight and Operating Instructions Manual CNAF M-3710.7" after extensive Root Cause Corrective Action (RCCA) analyses of aircraft systems and medical investigations since the PEAT's inception in 2017.

Vice Adm. DeWolfe Miller III, commander, Naval Air Forces, signed the overarching instruction Sept. 9 and it was released to the fleet Oct. 6, paving the way for updates to emergency procedures in the Naval Air Training and Operating Procedures Standardization (NATOPS) documents for the F/A-18 Hornet/Super Hornet and T-45 Goshawk, said Cmdr. Adrian "Catfish" Joep, PEAT lead.

"The updates are designed to change mindsets and outline procedures to mitigate and prevent physiological episodes," Joep said. Aviators rely on their specific platform NATOPS document for how to operate the aircraft, its systems and emergency procedures.

"We have been sharing what we've learned with the fleet in ready rooms and auditoriums during our PE briefings, or PE TED Talks, but now they have an updated instruction in the newly revised CNAF 3710 in which to reference," Joep said.

Major additions to the CNAF 3710 and follow-on proposed changes to the individual platform NATOPS include improved mask usage guidelines, the introduction of strategic air breaks to improve respiratory capacity, updated emergency procedures, as well as enhanced explanations of the functionality of On-Board Oxygen Gener-

ating System (OBOGS) and Environmental Control System (ECS), Joep said. The new NATOPS procedures are expected to be released to the fleet in the coming months.

"We've been told for a long time that we will wear our mask from takeoff to landing unless we needed to make subtle adjustments or move it aside to take a drink of water. Over the course of the last couple of years, we've learned that breathing with a mask for long periods of time can create physiological challenges, and if left unchecked can potentially lead to adverse physiological symptoms. As such, we have learned that by dropping the mask to take cleansing breaths at appropriate opportunities below 10,000 feet cabin altitude where hypoxia is not a concern, aircrew can help restore their normal physiological balance," Joep said.

The PEAT's Aeromedical Action Team (AMAT) also found that existing training for aviators and medical professionals was not extensive enough, so more in-depth information was added to the physiology chapter in CNAF 3710, said Cmdr. Allen "Doc" Hoffman, a naval flight surgeon who serves as the AMAT lead and Aerospace Medicine branch head with the U.S. Navy Bureau of Medicine and Surgery.

For example, the new physiology chapter covers the effects of breathing high-concentration oxygen through the OBOGS. Studies found one of the negative effects of breathing 94-percent oxygen is that it can wash out the nitrogen in the lungs, which in turn deflates the lung's alveoli in the bronchial tubes causing atelectasis, Hoffman said. To mitigate that effect in the cockpit, the updated instruction covers what the symptoms feel like and when to take a strategic air break to conduct controlled breathing cycles and reset the respiratory system.

"We want to educate aviators on how their body naturally responds to the

environment and environmental stressors just like you would when you run a marathon or you go weight lifting or you are in your car and another car almost sideswipes you—you are going to have a physiologic reaction. Those same reactions occur in the cockpit. The instruction educates them on which symptoms are significant and which ones they can mitigate in the cockpit and continue on their mission; that's a win for everyone, and ultimately, improves operational readiness," Hoffman said.

As an action team, the PEAT initiated the instruction updates. Changes are usually generated by the fleet, but in this case, the update was generated by the PEAT and AMAT and socialized with Naval Aviation Enterprise leaders as well as the fleet and medical community before being finalized, Joep said.

Working through the updates during the COVID-19 restrictions was also a challenge.

Members of the PEAT worked tirelessly during the summer to meet virtually with subject matter experts from aerospace medicine along with Naval Air Systems Command engineers and fleet model managers to finalize the changes.

More than 25 teleconferences and 500 manhours were spent updating the CNAF 3710 and an additional 50 teleconferences and 1,500 manhours were dedicated to the NATOPS changes, Joep said.

Fleet aeromedical safety officers were briefed in August and started sharing the training updates with squadrons in October.

Andrea Watters is editor in chief of Naval Aviation News. 🦅

PHYSIOLOGICAL EPISODES



U.S. Navy photo illustration by Fred Flerlage; photographic image by Erik Hildebrandt

A V-22 Osprey aircraft is shown on a tarmac at sunset. The aircraft is dark, and the background is a warm, orange-red sky. The title of the article is overlaid on the top left of the image.

FRCE Produces Critical V-22 Components

By Kimberly Koonce

U.S. Navy photo illustration by Fred Flerlage; photographic image by Lance Cpl. Andrew Skiver

If a V-22 squadron needs a titanium hydraulic or fuel line tube for one of its aircraft, Fleet Readiness Center East is the source to call. FRCE is the only U.S. military aircraft repair facility to have perfected the orbital welding process required to produce these critical components.

V-22 fuel lines and hydraulic tubes are made of titanium to withstand the high operating pressures and degree of vibration the aircraft experiences in flight.

FRCE engineers and artisans first began working to establish capability to weld titanium for fuel line and hydraulic tubes about 10 years ago, but results were uneven and customer demand was low. About two years ago, however, the Air Force requested that FRCE resume welding fittings onto the titanium tubes.

Welding fittings onto a titanium tube without defects proved to be extremely difficult to achieve. Mark Sapp, welding engineer with the FRCE Materials Lab, said that in spite of its strength, titanium is unforgiving of defects.

"It could be a matter of touching the surface with rubber, a scratch only three-thousands of an inch deep, or a fatigue characteristic—there are a lot of metallurgical considerations that could damage a titanium tube," Sapp said. A crack, a scratch or a void in the weld on one of these tubes could compromise its integrity.

Sapp said much of the knowledge gained in FRCE's first attempt at welding the tubes had been lost by 2017, but one rule guided the team's new quest for a perfect Class A weld.

"Clean, clean, clean was our mantra," Sapp said. "It took

quite a few evolutions before we could get our cleaning process down."

Erik Quinn, overhaul repair supervisor, said each step in the welding process was evaluated to determine if it was adding value or creating contamination.

"The requirement of a clean, contaminant-free atmosphere when it's in the chamber is what allows us to achieve a Class A weld," Quinn said. "After it completes the welding process, it goes through a nondestructive inspection process, and ... there are very strict requirements that have to be met through X-ray, as well. When you do this process, and it makes it all the way through successfully, you have just created the cleanest, strongest weld possible."

Part of the process includes acid etching the fittings before they are attached to the tube to ensure they are free from contaminants. This process was previously completed by materials engineers, who had to fit the process into their schedules. Now, welders have been certified to etch the fittings, which cuts several hours from the process.

Once the fittings are etched, they are then lined up precisely with the tube in the orbital welder to ensure a strong, clean weld.

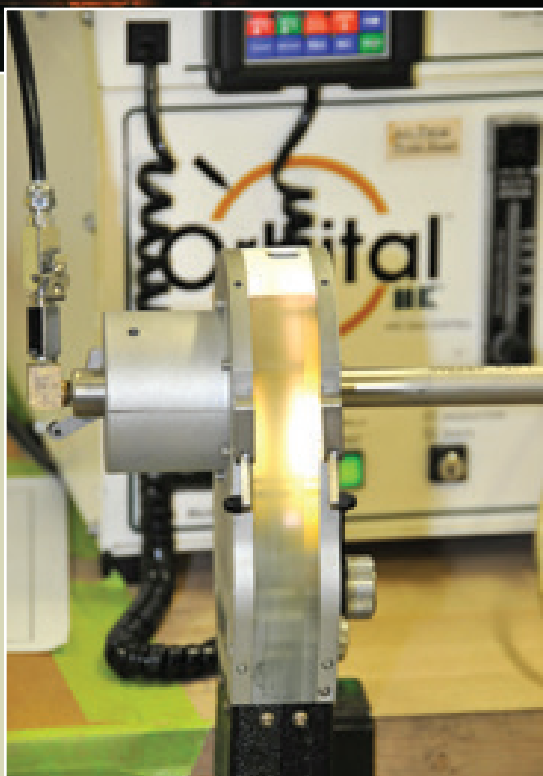
Robert Warmack, welder at FRCE, said the Orbital Welding Machine uses argon gas to purge any contaminants from the system, and then the welding begins.

"Once the arc hits and starts welding, it's a continuous weld that goes from one end all the way around the tube to the other," he said. "The welder makes one continuous orbit around the tube from start to finish. The fitting itself has a little bit of extra metal, that way it fuses on to the tube itself."

Sapp said because FRCE is the only DOD repair point for the



Robert Warmack, Fleet Readiness Center East welder, sets up an Orbital Welding Machine to weld fittings onto a titanium fuel line tube for the V-22 Osprey. FRCE is the only DOD aircraft maintenance facility with the capability to weld titanium hydraulic and fuel line tubes for the V-22 aircraft.



An Orbital Welding Machine performs a weld on a titanium fuel line for the V-22 Osprey.



A finished weld on a titanium tube for the V-22 Osprey.

flight-critical V-22 fuel and hydraulic lines, the team maintains close control over the welding process.

"If we make a mistake or if there's a failure in our production process we have to immediately go back and find that point of failure and get it corrected and make sure all who are involved understand what took place and what to look for," Sapp said.

Quinn said as the welding team refined its process, their reliability rate has steadily increased from a 30-percent pass rate two years ago to 85 to 90 percent today. Quinn credited the

perseverance of the project team with the ultimate success of the project.

"When you consistently see that you're failing, you can easily get deterred and lose your drive to continue through," Quinn said. "These individuals stayed vigilant, they stayed relentless, and they stayed on top of this to achieve what they've done. They have all done a wonderful job proving this process out."

Kimberly Koonce is a public affairs specialist at Fleet Readiness Center East. 🦅

CH-53K Integrated Test Team Stretches King Stallion's Sea Legs

By Paul Lagasse

A team of pilots and engineers from Air Test and Evaluation Squadron (HX) 21, based at Naval Air Station Patuxent River, Maryland, recently completed a crucial series of sea trials of the CH-53K King Stallion that not only provided them with valuable developmental test information about the aircraft, but could change the way the squadron conducts similar tests in the future.

The test team of 96 personnel embarked on USS Wasp (LHD 1) in early June to conduct an intensive series of tests that were designed to establish the helicopter's performance envelope for day and night launches and recoveries at a wide range of wind speeds; to test engaging, disengaging, folding and unfolding the rotors in a variety of wind conditions; and to allow maintenance crews from Sikorsky and Marine Operational Test and Evaluation Squadron (VMX) 1 to practice working on the aircraft in at-sea conditions.

"We went to sea with a robust test plan," said Maj. Joshua "Felon" Foxton, CH-53K sea trials project officer. "Typically you include more test points than you can reasonably expect to accomplish, which gives us greater flexibility in executing the plan. But due largely to the success of the aircraft, we were able to accomplish all of our objectives while we were underway."

Over the course of the 14-day detachment, the team accomplished more than 32 hours of flying, well over a third of which were flown at night. Altogether, the team achieved 364 landings; 74 landings were conducted using night vision devices. The team successfully launched and recovered

to all spots, and was able to launch 13 sorties in the first eight days of ship-based maintenance.

Foxton praised the CH-53K's performance, noting that the responsive and well-tuned fly-by-wire controls make shipboard landings much easier and more precise than is possible with many other helicopters.

"It's a real testament to the stability of the aircraft," Foxton said.

Lt. Col. Fred "NOVAC" Neubert, department head and government lead test pilot for the CH-53K program, agreed with Foxton's assessment.

"There may be other aircraft out there with similar performance capabilities, but I have not flown a helicopter with the outstanding handling qualities that the 53K provides," Neubert said.

The aircraft performed so well, in fact, that the test team succeeded in testing nearly all of the aircraft's launch and recovery envelope expansion—the team's primary test objective—within the first seven days, leaving the second week to thoroughly pursue other objectives. As a result, the test team was able to devote more time to identifying refinements and minor improvements to suggest to the manufacturer than it otherwise would



U.S. Navy photo

A CH-53K King Stallion, assigned to Air Test and Evaluation Squadron (HX) 21, participates in recent sea trials aboard USS Wasp (LHD 1).

have had. Foxton recalled how, during one post-flight debriefing, one of the team's veteran flight engineers pointed out, "Do you realize we just spent 15 minutes talking about whether we could improve the windshield wipers?"

"We were able to focus on those little things because the big things took care of themselves," Foxton said.

Teamwork was another major factor in the detachment's success.

"It can sometimes take weeks or months for a team to coalesce, but we had 14 days underway to forge a team," Foxton said. "Thanks to the professionalism of the contractors, our Marine counterparts in VMX-1, and our colleagues in the Navy, we were able to accomplish everything so thoroughly that we were actually able to fly the aircraft off a day earlier than we had planned. That was inspiring."

Neubert and Foxton also had plenty of praise for the Wasp's crew.

"The crew was amazing," Foxton said. "They carefully negotiated winds and



U.S. Navy photo

A CH-53K King Stallion flies off USS Wasp during sea trials to establish the helicopter's performance envelope for day and night launches and recoveries at a wide range of wind speeds.

weather for us in order to get the ship in the exact position with the conditions we needed for every test point. Their true professionalism enabled all of our successes."

"One of the things that stands out about this detachment was the quality of the ship's crew from the leadership on down, their commitment to figuring out

a way to make it work no matter what we needed," Neubert said. "I think that reflects the command culture. The ship's Commanding Officer, Capt. Greg Baker, likes to get to 'Yes.' Every department embodied that mentality."

The envelope expansion testing that the team accomplished has resulted in the largest fleet envelope for any Navy and Marine

Corps helicopter currently in existence, according to the squadron.

"I think this detachment is going to rewrite how we plan a test phase," Foxton said. "It's an opportunity for us to find very specific efficiencies in our testing, which will in turn increase our speed to the fleet."

Neubert agreed.

"In flight test, we specialize in risk mitigation and preparing for how we will respond to something that goes wrong," Neubert said. "What we discovered in this test is that in the future, we'll want to spend more time planning how we will respond if something goes unexpectedly great.

"Our objective is to provide the fleet Marines with a safer and more effective platform with greater operational capability, and this detachment was a successful example of that," he said. "This is why we do flight test—because we come from the fleet, and we want to give good products back to the fleet."

Paul Lagasse is a public relations specialist with Naval Test Wing Atlantic. ✈

NAWCWD, Amyris Collaborate on **HIGH-ENERGY BIOSYNTHETIC FUEL**

From Naval Air Warfare Center Weapons Division Public Affairs

Biosynthetic researchers with the Naval Air Warfare Center Weapons Division (NAWCWD) and Amyris Inc. are taking a common ingredient of liquid jet fuel and bread—yeast—to develop a high-density weapon fuel.

Funded by the Defense Advanced Research Projects Agency's (DARPA) Living Foundries: 1000 Molecules Program, the project—headed by NAWCWD in China Lake, and Amyris Inc., a biotechnology company headquartered in Emeryville, California—aims to specially develop yeast cells into a high-density missile fuel.

Synthetic biology is a field that involves engineering organisms to reliably produce a specific, naturally occurring substance, such as a medicine, sweetener or a complex mixture of hydrocarbons. In Amyris' case, researchers genetically modify yeast cells to ferment sugar into molecules that can be difficult to reliably, sustainably or affordably obtain.

"Think about the rose oil we use in fragrances," said Dr. Patrick Rose, science director for synthetic biology for the Office of Naval Research Global. "Right now, you'd have to seed a field of roses, let them bloom, harvest the petals, then process and purify the product."

That process is time consuming and labor-intensive for

an impure and unreliable outcome. Modified bacteria can produce a purer sample of the same compound through fermentation. And it's not just rose oil; a wide range of biological molecules can be produced in this manner.

In order to trace what molecules are needed, partnerships between government, industry and academia become important.

"Over the course of the Living Foundries program, DARPA often played 'matchmaker' to connect Amyris with scientists in the Army, Air Force and Navy," said Dr. Adam Meadows, principal scientist in Amyris' Process Development and Manufacturing Department. "Dr. Benjamin Harvey [NAWCWD's senior research chemist] was able to provide guidance on which classes of biomolecules were most interesting in the fuels and material space."

Conventional hydrocarbon fuels are produced by distillation of crude oil. This process generates a variety of products including gasoline, diesel and jet fuel. However, these distillates include sulfur-containing and aromatic compounds that can lead to acid rain, engine corrosion and particulate formation. This leads to lower performance and increased maintenance costs for the Navy.

Then there are synthetic fuels, which are produced by combining specific petrochemical molecules to generate fuel mix-

Chemists with the biotech company Amyris are working with Naval Air Warfare Center Weapons Division (NAWCWD) to use specially developed yeast to create a high-density missile fuel. Note: Photo was taken prior to COVID-19.



Photo courtesy of Amyris, Inc.

tures. Fuels of this type are typically expensive and methods to generate them can be carbon inefficient and energy intensive.

“Synthetic missile fuels are expensive and biosynthetic surrogates offer an opportunity to decrease costs,” Harvey said. “The use of biosynthetic fuels in jet and diesel engines can also increase the range and fuel economy of aircraft, ground vehicles and ships, while reducing the emission of toxic particulates and resulting in lower net greenhouse gas emissions.”

More familiar are biofuels like ethanol made through a fermentation process, or biodiesel, which comes from processing vegetable oils. Neither has the energy density, purity or stability of a biosynthetic fuel.

Through the program, Harvey’s team at NAWCWD developed a process to convert a complex mixture of biosynthetic hydrocarbons (produced by Amyris) to a high-density missile fuel. This fuel was recently ground-tested in a liquid fuel ramjet test stand, representing a first-of-its-kind demonstration.

“No one has ever produced a biosynthetic fuel with comparable energy density to the synthetic missile fuel JP-10, and tested it in both a turbine engine and a system that mimics conditions found in a liquid fuel ramjet engine,” Harvey said.

BioRenewable-1, the fuel Harvey’s team produced, has up to 19 percent higher volumetric energy density than conventional jet fuel. That’s comparable to JP-10, a synthetic fuel currently used to power cruise missiles.

“BR-1 has an energy density high enough for use in high performance military systems,” said Dr. Anne Cheever, program manager for the Living Foundries program. “Biologically produced fuels can have advantages in cost and performance over comparable synthetically produced fuels and

could be an additional source of military-grade fuels during times of higher demand.”

Regardless of the fuel source, the cost of logistics must be accounted for. Moving the tons of fuel needed to keep the fleet afloat is expensive and can be a vulnerable link in the supply chain. Rose noted that moving yeast and sugar as fuel precursors would be more cost-effective and could possibly be less vulnerable due to their lower dollar value and relative ease of acquisition.

“The COVID-19 pandemic, while demonstrating the nation’s vulnerabilities to biothreats, has also shown the fragility of the supply chain,” said Dr. Michelle Rozo, principal director for biotechnology, Office of the Undersecretary of Defense for Research and Engineering. “The United States relies on foreign suppliers for a number of critical components including petrochemicals, rare earth minerals and active pharmaceutical ingredients. Biomanufacturing of synthetic fuels will provide supply chain resiliency for the department.”

Finding opportunities to strengthen that resiliency—and advancing the science of biotechnology—requires collaboration across government, industry and academia, Harvey said, noting that “cross-disciplinary interactions enable us to creatively solve recalcitrant problems.”

“Working with industry and academia allows us to build teams with an array of expertise,” he said. “This force multiplying strategy enables DARPA and NAWCWD to greatly accelerate the pace of research while reducing costs. The Navy is not in the business of fuel production. Instead, we seek to transition our technology to commercial partners so they can produce these materials to support the warfighter.” 🦋



Dr. Ben Harvey, NAWCWD senior research chemist, and a group of NAWCWD chemists, pictured here in 2019, are working with government and industry partners to study the development of biosynthetic fuels.

U.S. Navy photo by Paul Kakert

RQ-21 Takes First Australian Flight



A U.S. Marine Corps RQ-21A Blackjack was flown for the first time in Australia as part of the annual Marine Rotational Force-Darwin (MRF-D) on Aug. 8.

Marine Unmanned Aerial Vehicle Squadron (VMU) 3, MRF-D's Air Combat Element (ACE), launched the surveillance aircraft in support of bilateral training between the U.S. and Australian Defence Forces, marking a series of firsts for the Hawaii-based unit.

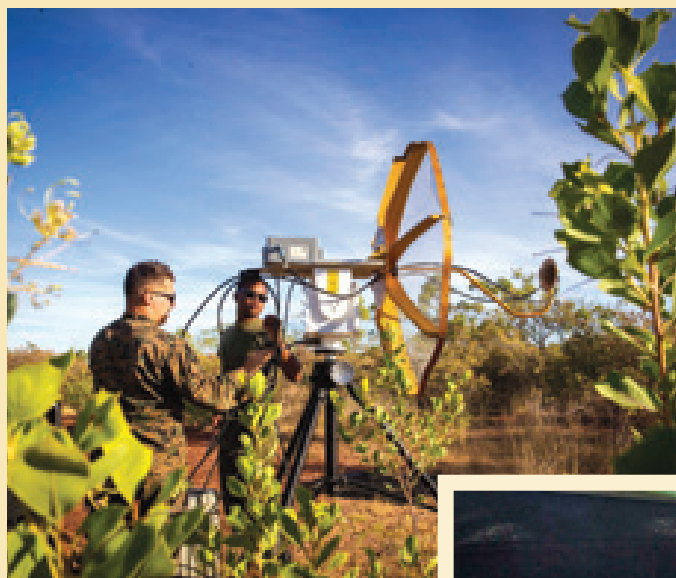
"This is the RQ-21A's first deployment since we declared the squadron [fully operational], it's very exciting for us," said 1st Lt. Trevor Ellingson, an unmanned aircraft systems officer with VMU-3.

This historical milestone comes in the midst of an unusual year for MRF-D. In order to ensure health and safety of Australians and U.S. service members amid the COVID-19 pandemic, the rotation was delayed by two months, reduced from 2,500

Marines to just more than 1,000 and saw the ACE—which was originally composed of several squadrons of manned aircraft including MV-22 Ospreys—reduced to just 32 Marines.

However, the smaller footprint offered MRF-D an opportunity to exercise unmanned systems' capacity to support expeditionary advance bases and positions following modernization initiatives led by the Commandant of the Marine Corps, Gen. David H. Berger.

In line with these future operating concepts, Ellingson said that the unit, "didn't bring a lot of manpower. We made our detachment as small as possible to get the mission accomplished. Out here, we're training to be fast, agile, to be able to setup, get a bird in the sky as fast as we can and teardown quickly."



Lance Cpls. Brayden Broens and Dominick Rollan set up the Ground Data Terminal at a RQ-21A Blackjack spoke site.



1st Lt. Trevor Ellingson, unmanned aircraft systems operator, prepares to receive operational control of the RQ-21A Blackjack at a spoke site.

U.S. Marine Corps Capt. Douglas Bohr and Cpl. Dalton Kiser, with Air Combat Element, Marine Rotational Force – Darwin, conduct preflight checks on the RQ-21A Blackjack at Bradshaw Field Training Area, Northern Territory, Australia, on Aug. 9.

enabling capability within distributed operations. The aircraft can be rapidly deployed with a limited footprint and provide anything from route reconnaissance and target confirmation to intelligence collection for both unilateral and multilateral operations. These capabilities are amplified by the system's ability to extend its flight distance using spoke sites as a way of extending the hub site's reach.

"The spoke site, which enables UAS [Unmanned Aircraft Systems] operators to fly the aircraft conveniently from the rear of a Humvee, also extends the range of the aircraft from the hub," said 1st Lt. Matthew Tatarka-Brown, a UAS officer.

During a timed training event, the Marines were challenged to deploy from the hub location and establish a spoke site. All the

In a real-world mission, Marine Air Ground Task Force elements would be swiftly and secretly deployed within striking distance of adversaries. These small teams would provide specific mission-tailored capabilities to shape the battlefield for follow on and larger naval forces.

necessary equipment for the spoke fit snugly into two high-back Humvees.

"I lead a small group of Marines in detaching from the main body to setup the spoke site," said Tatarka-Brown. "We got it up within an hour and 10 minutes, but we're always aiming to get it up quicker."

Tatarka-Brown said the spoke site is extremely valuable because "it's self-sufficient for a short period of time. It gives us the ability to have multiple aircraft doing separate missions simultaneously within the area of operations."

To test this concept, the ACE also pushed live video from the spoke-operated RQ-21 to MRF-D's Command Element—a first for the Marines to do so through a satellite communications system.

"We're able to be that eye in the sky for long periods of time, providing battlefield situational awareness, pattern of life, whatever our joint force commander is looking for," Ellingson said.

The ACE continued training with its Australian counterparts through October.

Written by Cpl. Harrison Rakhshani with Marine Rotational Force-Darwin. 🦅

Marines recover the RQ-21A Blackjack following spoke operations.



Test Pilot School Opens Doors

By Paul Lagasse

When naval flight officers (NFOs) hear the name “United States Naval Test Pilot School,” many conclude it is open to aviators only. They’re surprised to learn the school also welcomes applications from NFOs and engineers who want to pursue a career in developmental flight test.

USNTPS offers a fast-track into the exclusive ranks of the Navy and Marine Corps acquisition community, which is responsible for readying the aircraft, systems and weapons of tomorrow.

One might be surprised to learn that Rear Adm. Scott Dillon, commander, Naval Air Warfare Center

competent and tactically capable first-tour Navy lieutenants and Marine captains with top fitness reports.

“I was intrigued by the fact that the school’s technical curriculum is complemented by once-in-a-lifetime flying opportunities in different types of aircraft that I would not otherwise have had an opportunity to fly as a Navy P-3 NFO,” said Dillon, whose first tour was with Patrol Squadron (VP) 1 in Hawaii. “I was also really impressed by the fact that when you graduate, you immediately have an opportunity to apply what you’ve learned at a test squadron, which is right at the center of the development and acquisition of new aircraft and new systems for the fleet.”

Gahagan’s experience was similar. He first heard about USNTPS when friends applied to the school when he was a junior officer assigned to Carrier Airborne Early Warning Squadron (VAW) 115 in Atsugi, Japan, and again when he became an instructor at VAW-110 following his first tour.

“I touched base with them and they all viewed the program very favorably,” Gahagan said. “They said they were testing new capabilities and the latest technology that was going to be delivered to the fleet. That really got me interested, and I applied and was accepted.”

A career in flight test appealed to Somerville from her earliest days in the Navy flying in EA-6B Prowlers with Electronic Attack Squadron (VAQ) 141 out of Whidbey Island, Washington.

“I had a fantastic tour, and then like most people as they near the second half of their tour I started thinking, ‘Well, what do I want to do next? Where do I think my skillset is best in line with the various missions in the Navy?’” said Somerville, who at that time already had a degree in aeronautical and astronautical engineering from the Massachusetts Institute of Technology. “I have always had a strong interest in solving problems and in building and fixing things, and that really seemed to line up well



U.S. Navy photos by PR1 Brandon Cole

Rear Adm. Shane Gahagan, Program Executive Officer, Tactical Aircraft Programs, listens to a brief at a Boots on the Ground event at Fleet Readiness Center Mid-Atlantic in 2019.

Weapons Division (NAWCWD), Rear Adm. Shane Gahagan, Program Executive Officer, Tactical Aircraft Programs, and Capt. Elizabeth Somerville, chief test pilot and future Commanding Officer of Air Test and Evaluation Squadron (VX) 23, are all NFOs. All three are also USNTPS graduates and they credit the school with honing the skills they needed to advance to their current positions and prepare them for what comes next.

Successful USNTPS applicants are technically

for Naval Flight Officers

with the flight test mission. That's what drove me to apply to USNTPS."

All three NFOs are also Aerospace Engineering Duty Officers, or AEDOs, which means they provide management oversight of aerospace weapons systems throughout their life cycle. The AEDO path leads officers to command positions with test and evaluation squadrons, naval air test and warfare centers and program management positions within the Naval Air Systems Command. And the AEDO community prefers to cultivate new candidates from the NFOs who graduate USNTPS as well as from the U.S. Naval Postgraduate School.

"My follow-on tour in VX-20, and my subsequent tours in program offices and other acquisition-related organizations including NAWCWD here in China Lake have all been available to me as a consequence of graduating from USNTPS," Dillon said. "USNTPS opens doors not only for AEDOs like myself, but also for unrestricted line officers. It creates additional opportunities that are central to the entire process of fielding new systems that would not be available to people who don't have that background."

Gahagan said the critical thinking skills he honed at USNTPS played a valuable role in helping him find career opportunities in positions where such skills were considered essential.

"When I transitioned to the AEDO community, I carried those tools with me and I think they really do improve your decision-making quality," Gahagan said. "You bring the ability to analyze factual data, your experience, your intuition and your judgment, and I think over time it makes for more informed, better decisions. And if you can do that in your career, it's bound to help you in the long run."

"USNTPS is 100 percent the key enabler to my entire career," Somerville said. "I have enjoyed every tour I've done because of the people I've had the privilege to work with, but without USNTPS I wouldn't have had the chance to do those tours and meet those people."

Somerville said she was fortunate that her arrival at VX-31 in China Lake, California, coincided with the squadron's initial testing of the EA-18G Growler electronic warfare aircraft.

"I went from not even knowing where China Lake was to doing a tour as a department head in

the Growler and being part of the first squadron to deploy with the Growler onboard an aircraft carrier," namely USS George H.W. Bush (CVN 77).

"None of those tours would have been possible without the education and the experience and the backgrounds that USNTPS gave me," she said.

Dillon said that acquisition is about finding all the ways that a new system can fail to operate if some crucial detail is overlooked during the development cycle. "USNTPS trains people to pay attention to those details and to know what sort of technical concerns to be on the lookout for," said Dillon, who oversaw the completion of the P-8A



U.S. Navy photo by Ron Rodriguez

Poseidon's initial operational testing and evaluation as program manager of the Maritime Patrol and Reconnaissance Aircraft Program. "That way, problems can be discovered early and corrected while they're still relatively easy to change, so that they never become an issue or a concern for the fleet operator."

"If you're the sort of person who is both technically oriented and determined to dig into the details to determine whether or not we have truly gotten

Rear Adm. Scott Dillon, commander, Naval Air Warfare Center Weapons Division, participates in a change of command ceremony at Naval Air Weapons Station China Lake, Calif. Note: Photo taken before COVID-19.

“The NFO’s responsibilities will become much more challenging and demanding. USNTPS will help prepare you for those responsibilities.”

Capt. Elizabeth Somerville, chief test pilot, Air Test and Evaluation Squadron (VX) 23 and former Commanding Officer of VX-31, earned her Wings of Gold as a naval flight officer in October 2000.

the design right, then you probably have the right sort of personality not only for test pilot school, but also for your follow-on assignment to a test squadron,” Dillon said.

Gahagan encourages NFOs to consider applying to USNTPS if it aligns with their career goals, their career timing and the needs of the Navy. “If all of those things align, it is a rewarding and challenging experience,” said Gahagan, who has also served as commander, Naval Air Warfare Center Aircraft Division. “And I’ll tell you, it allows a lot of options in your Navy career. It gives you a different approach

in the warfighting arena because you understand a system’s capabilities and how it was developed, and those skills are in demand.”

“As the Navy shifts from autonomous operations to a more integrated approach that relies on aircraft like the E-2D Advanced Hawkeye, the P-8 Poseidon and the Growler, I think the NFO will play a bigger role in air combat,” Gahagan said. “The NFO’s responsibilities will become much more challenging and demanding. USNTPS will help prepare you for those responsibilities.”

Somerville encourages NFOs who are considering applying to USNTPS to pursue a career in flight test and acquisition not to worry about how they will measure up against other applicants.

“The important thing is to walk in the door with the confidence of an individual who is an expert in your aircraft and who has all the qualifications that are expected of you at this stage in your career,” Somerville said. “As long as you have the willingness to work hard and have some technical or science background, then USNTPS will teach you the test and evaluation mission.”

“First as a project officer and later as a department head, you will get to make the calls to determine how these capabilities and platforms are going to be developed and to keep them on track when they run into roadblocks,” said Somerville, who also served as VX-31’s chief test pilot and Commanding Officer. “And then, when you go back out in the fleet, you’ll be able to point to that aircraft or that weapons system with pride and say, ‘You know, I played a big part in bringing that to the fleet.’”

Paul Lagasse is a public affairs specialist with U.S. Naval Test Pilot School Communications. ✈



U.S. Navy photo by Paul Lagasse

Apply to USNTPS

To learn more about USNTPS and how to apply, visit <https://www.navair.navy.mil/nawcad/usntps>.

The school’s academic rigor and excellence requires a highly competitive admissions process. Though not required, applicants typically hold degrees in engineering, physical science or math. Those without the requisite courses can make themselves competitive by completing correspondence courses at USNTPS.

Prospective test pilots have typically flown more than

1,000 flight hours. USNTPS evaluates military aviators by a selection board for flight qualification, professional performance, academic background and requirements of the service. The school evaluates engineers similarly with emphasis on experience, performance and flight suitability.

All interested candidates are encouraged to apply. ✈

Professional Reading

By Cmdr. Peter Mersky, USNR (Ret.)

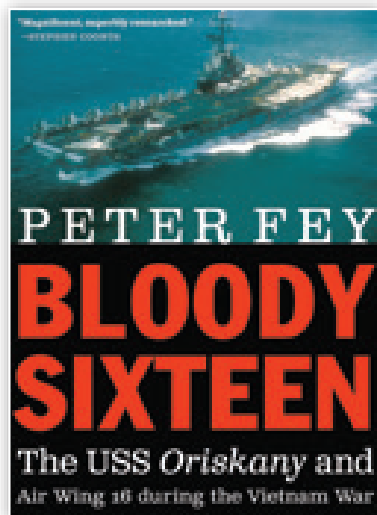
Bloody Sixteen, The USS Oriskany and Air Wing 16 during the Vietnam War

By Peter Fey, Potomac Books, University of Nebraska Press, Lincoln, Nebraska. 2018. 393 pp. Ill.

Of all the people and events that characterize the U.S. military experience in Vietnam, especially that of Naval Aviation and its flight crews, one of the most consistently gut-wrenching accounts are the 1960s deployments of USS Oriskany (CVA 34) and its air wing, Carrier Air Wing (CVW) 16. Even today, nearly 60 years later, those members of this fabled ship, air wing and its story evoke such strong memories that, truth be told, it is difficult for the veterans, many now in their 80s, to talk about their experiences, the missions, their shipmates and, of course, the catastrophic fire that occurred on Oct. 26, 1966, when so many of the ship's company and air wing lost their lives under terrible circumstances that can only be described in one word: Horrific.

Anyone who has written about Naval Aviation during the Vietnam War, myself included, cannot forget "Bloody Sixteen," and the memories that will never be forgotten. This well-researched and detailed account of Oriskany's 1965, 1966 and 1967 deployments begins with an equally well-thought-out introductory chapter with sections dealing with specific subjects such as what it took to fight a war in Southeast Asia that the U.S. was unprepared for, various weapons and training, including particular aircraft types. There is also a political synopsis as background of the war that is one of the best such descriptions I have read, along with descriptions of North Vietnamese defenses against the growing U.S. campaign that developed into Rolling Thunder, the major bombing campaign against North Vietnam's facilities that supported their war against America.

Peter Fey is a retired commander and EA-6B Prowler electronic countermeasures officer with considerable flight experience in other aircraft and is thus well-qualified to write this major work. His discussion of early events including the first MiG kills and creation of Dixie Station and Yankee



Station as the war evolved and the need for carriers and their air wings became more acute is also worthy of note. His book soon becomes a fine overall history of the Vietnam air war but he never loses focus of his treatment of the main subject of the experiences of Oriskany and her brave, dedicated air wing and all who served in her.

Fey describes how devastating the 1965 deployments were and the carriers and their squadron members. He mentions then-Lt. Bud Flagg, a U.S. Naval Academy graduate who flew Crusaders with Fighter Squadron (VF) 162 over North Vietnam and who had asked and received permission from "Peanuts" creator Charles Schultz to use the "Snoopy" character in a squadron symbol. In Fey's opinion, his move to increase squadron morale met with criticism from many aviators contesting the terrible losses and is an interesting variation of the well-known story that contrasts with what seems to be the popularity of the mascot on the vertical tails of the Hunter F-8Es.

Flagg logged more than 3,000 hours in the Crusader, served many years in the Navy, eventually rising to two-star rank in the Reserves as the high-time Crusader driver in both the F-8 and RF-8G, and squadron CO of Photographic Recon-

naissance Squadron (VFP) 206. (He and his wife, Dee, were on American Flight 77a when 9/11 terrorists flew their heavily loaded airliner into the Pentagon.)

After describing how devastating the 1965 deployment was for the carrier and its air wing squadron—the air wing commander, James Stockdale, had been shot down and captured on Sept. 9, 1965, and several pilots and their aircraft had been also been lost—he also writes about early MiG encounters, and goes on to describe the next two "O boat" deployments in 1966 and 1967. If there had been any thought that these succeeding cruises might have been easier, those hopes were soon dashed as losses continued, punctuated by the aforementioned fire on Oct. 26, 1966, aboard the Oriskany when 44 men perished and more than 100 air wing aviators and ship's company were injured because of poor handling of flares by junior ship's company Sailors, and lack of personal breathing apparatus and exit passages.

There was also a growing shortage of ordnance, especially bombs, and CVW-16's sorties were marked by launching aircraft with improper bombloads that often included very old bombs from Air Force sources from the Korean War.

Chapter 8, "The Battle Increases," begins with a brief discussion of the effects of the intense POL campaign and the introduction of SA-2 SAMs, which allows Fey to display his professional knowledge of ECM and its initial effect on the air war. It was also the time of growth of the enemy's defenses that saw increases in SAM and AAA batteries along the ingress and egress routes that became too well-known by the North Vietnamese ground crews who learned how to pinpoint their targets with growing accuracy.

Growing dissension in the Pentagon as the generals and admirals grew increasingly combative against Secretary of Defense Robert S. McNamara, certainly shows how

and why the conflict was not proceeding as planned. In turn, McNamara made no secret of his mounting feelings about what he felt were his forces' disability in winning the war.

North Vietnamese MiGs began making limited appearances during the 1965 cruise. Flagg had caught sight of one but couldn't get into an engagement with the MiG-17, whose pilot disappeared in a cloud and escaped further attention from the young pilot. By the 1966 deployment, however, MiG activity had increased and now the aging little MiG-17's threat was augmented by the world-class MiG-21 that was fast and maneuverable. North Korean "volunteers" often flew Vietnamese MiG-17s and, according to some unofficial

sources, occasionally their own MiG-21s.

The Oriskany's VF-162 F-8Es engaged several MiGs and often received as good as they got. Fey describes the growing MiG presence that was beginning to have more meaning for U.S. crews.

Besides the more glamorous MiG engagements, the Oriskany's CVW-16's light-attack A-4 squadrons were in the thick of the fighting and, as a result, the air wing's losses were equally terrible with appalling personal injuries, deaths and imprisonments that often resulted in incarceration and inhuman torture that went on for more than five years. Fey ends his book with a 14-page discussion of the experiences of prisoners of war in Vietnam, the men as well

as their families who spent waiting for even the slightest word of their captured loved ones languishing away, some dying, in their cells somewhere in the enemy's cities.

His final chapter, "Because Our Fathers Lied," leaves concerned readers wondering at the expense of American experiences in Vietnam, not only in terms of financial expense, but of the lingering personal emotional assessment of that long period in American history, and at the heart of the story is that of the Oriskany and its air wing. Highly recommended for veterans of those deployments as well as Americans of all ages and experiences who may still want to know more about this part of the Vietnam War. 🇺🇸

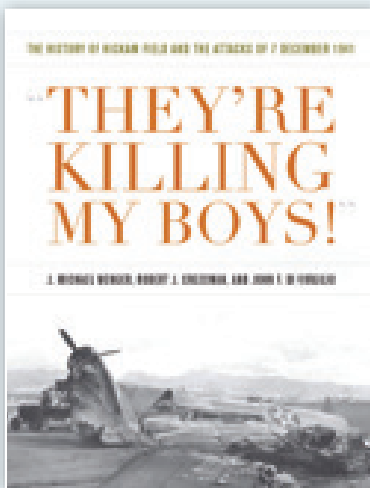
"They're Killing My Boys!" The History of Hickam Field and the Attacks of 7 December 1941

By J. Michael Wenger, Robert J. Cressman and John Di Virgilio. 296 pp. Ill.

The third book in the series dealing with the Japanese attack that brought America into World War II, this book moves away from the main strike against the facilities at Pearl Harbor itself and delves into the events surrounding the Army's airfield on Oahu. As well as hoping to hit Navy aircraft carriers they would find at Pearl—which in the event they didn't—the Japanese also wanted to destroy any long-range bombers the Army might have and put out of commission their airfield, that would be used to search for and destroy the Japanese attacking force, especially their six carriers.

Using heretofore restricted personnel records, this team of three diligent historians have done very well in telling the full story of the surprise attack on what should have been a regular quiet, restful Sunday morning in the Navy's distant naval base. Focusing on the Army's side of the story, on nearby Hickam Army Air Field, we see a different, yet highly detailed, side of the overall story of the Pearl Harbor strike and especially that concerning the Army's bomber units, many of which actually launched in unproductive searches for the Japanese attackers using B-17s and obsolescent B-18s.

As in the two previous books, we get a fine impression of what life was like before the strike for Soldiers and Sailors



stationed at the paradise atmosphere of the Hawaiian Islands as the U.S. unknowingly approached its staggering entry into the war.

The buildup to the account of the attack is long, even labored, with the three authors adding layers of details, but they obviously have the room to do it and the photos to support all their work. Although this third book does concentrate on the Army experience, one naval aspect is the junior ranks of the Japanese pilots and senior officer crews flying the strikes. The makeup of Japanese flight crews in multi-place aircraft makes an interesting and contrasting view of how the Japanese flew their missions. Command

was not necessarily in the hands of the pilots, and more often was given to lieutenants and lieutenant commanders behind the pilots, who could actually be third class petty officers and even seamen, a deviation not seen in any other country's service in such regularity.

On the American side, an alert reader will definitely be surprised at the rapid advancement of junior officers at the time of the attacks to colonels and even generals within one or two years, which probably gives an idea of just how tough the pace of combat was in the first year of the war for American participants, an aspect seldom addressed in most accounts. 🇺🇸

Squadron Spotlight

Strike Fighter Squadron (VFA) 27

Established: Sept. 1, 1967

Based: Marine Corps Air Station
Iwakuni, Japan

Commanding Officer:

Cmdr. Joseph J. Hubley

Mission(s): *Provides combat ready Sailors and aircraft in support of our nation's strategic objectives. When called upon, we will win quickly and decisively.*

Brief History: The "Royal Maces" were commissioned as Attack Squadron (VA) 27, originally designated the "Chargers," on Sept. 1, 1967, flying the A-7A Corsair II. Throughout the squadron's 53-year history, the Chargers and Royal Maces have conducted flight operations from the flight decks of six aircraft carriers and supported combat operations in Vietnam, Iraq and Afghanistan. The squadron, originally based at Naval Air Station Lemoore, California, was relocated to Naval Air Facility Atsugi, Japan, in 1996, and since 2018 has been based out of Marine Corps Air Station Iwakuni, Japan.

The Royal Maces have been recognized as the Adm. C. Wade McClusky winner, and the Commander Naval Air Forces Pacific Battle "E" winner in 1972, 2005, 2006 and 2014. The Royal Maces will continue to patrol the Indo-Asia-Pacific region as part of America's only permanently forward-deployed "911" carrier air wing.



Aircraft Flown: A-7A Corsair II; A-7E; F/A-18A Hornet; F/A-18C Hornet; F/A-18E Super Hornet

Number of People in Unit:

244 active duty military

Significant Accomplishments: During March 2020, the Royal Maces completed Strike Fighter Advanced Readiness Program (SFARP) at Andersen Air Force Base, Guam. The aviation ordnance team executed demanding flight schedules with some of the Navy's most unique weapons. The Royal Maces employed more than 87,000 pounds of general-purpose, laser-guided and GPS-enabled air-to-surface ordnance, as well as multiple air-to-air weapons. The opportunity to employ this variety of live ordnance made VFA-27 and Carrier Air Wing (CVW) 5 a more lethal and proficient warfighting team.

Squadron personnel were moved in waves from restriction of movement sequestration to either the island of Iwo To (formerly known as Iwo Jima) for field carrier landing practice or directly to USS Ronald Reagan (CVN 76) to begin deployment. This unprecedented triple-site operational footprint allowed the squadron to maintain full readiness in support of 7th Fleet strategic objectives while maintaining COVID-19 prevention and mitigation protocols.

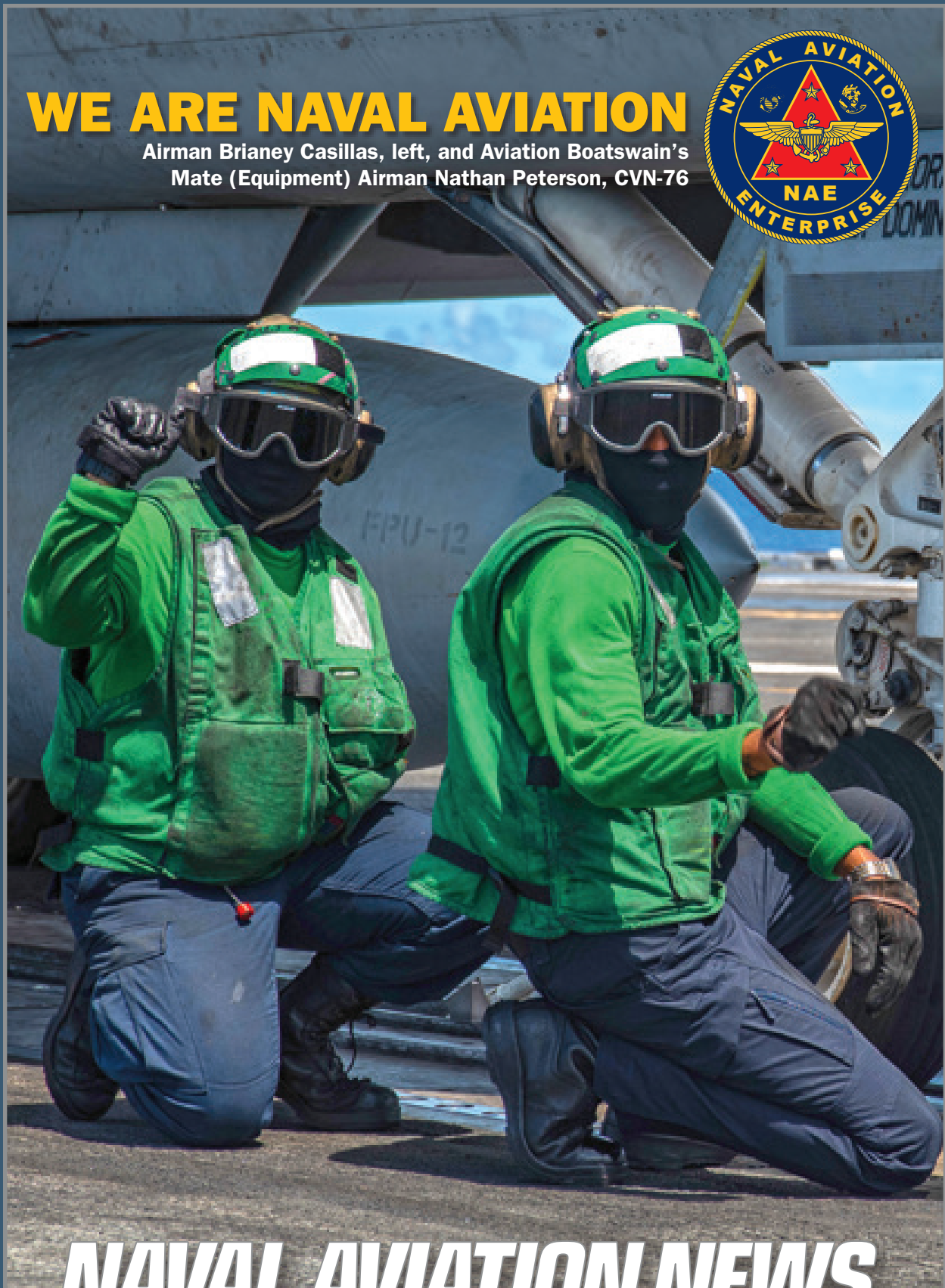
In July, the Royal Maces and CVW-5 had the opportunity to team up with CVW-17 onboard USS Nimitz (CVN 68) for dual carrier operations in the Indo-Pacific as the Nimitz Carrier Strike Force.



U.S. Navy photo

WE ARE NAVAL AVIATION

Airman Brianey Casillas, left, and Aviation Boatswain's
Mate (Equipment) Airman Nathan Peterson, CVN-76



NAVAL AVIATION NEWS