NAVAL AVIATION NEWS

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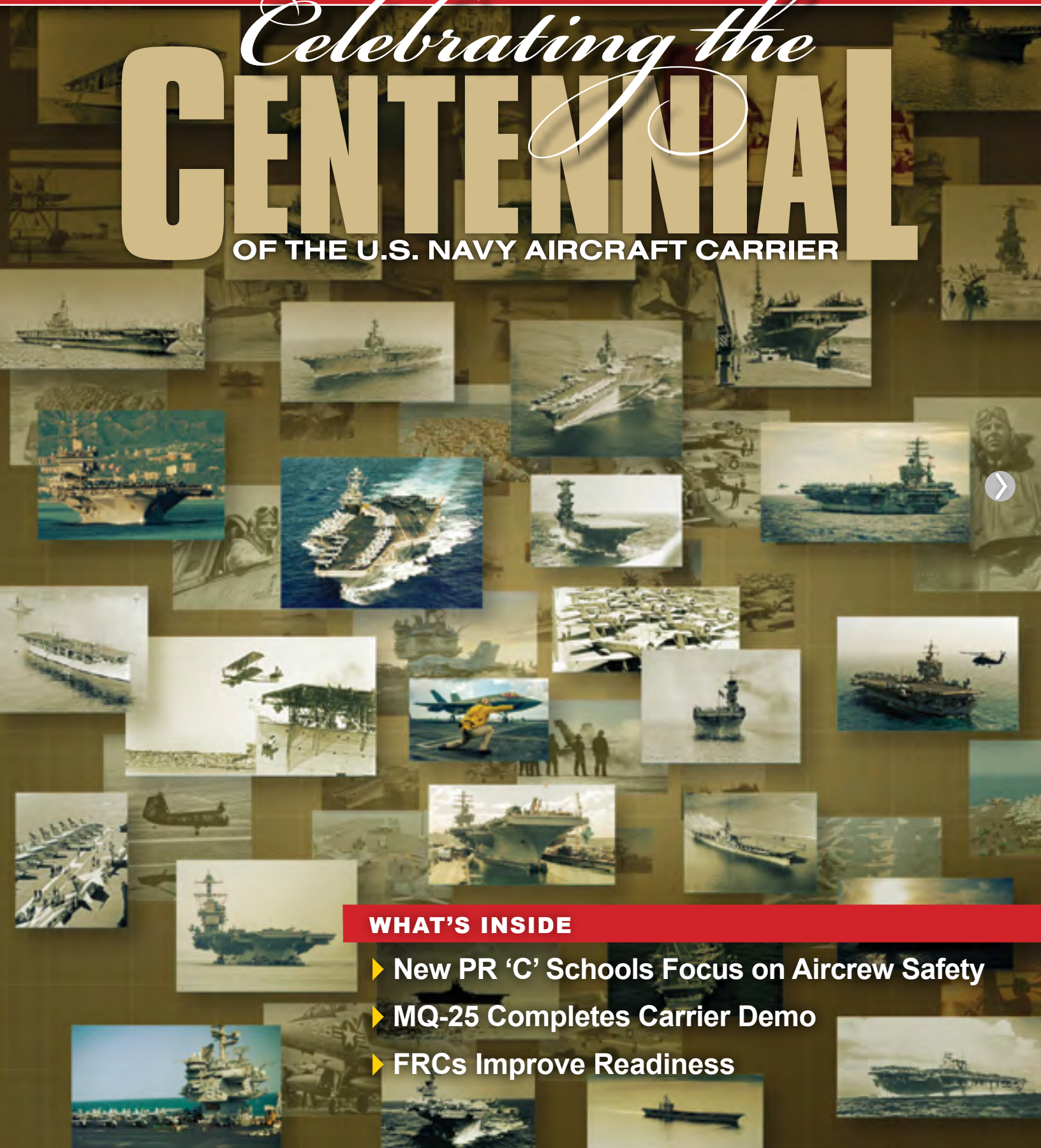

Celebrating the CENTENNIAL

OF THE U.S. NAVY AIRCRAFT CARRIER

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On the cover: *We've created a collage representing 100 years of milestones with U.S. Navy aircraft carriers. (Photo illustration by Fred Flerlage; photographic imagery by U.S. Navy; archived images courtesy of Naval History and Heritage Command)*

In this edition of Naval Aviation News, we herald the celebration of the Centennial of U.S. Navy Aircraft Carriers with a look back at the evolution of the Navy's formidable and important fleet asset on page 26. On page 22, we focus on the creation of four new Parachute Rigger "C" Schools, a major step in addressing proper gear fit as a way to ensure aircrew safety. We also take a moment to highlight outstanding women in Naval Aviation as they achieve historic firsts on page 18. As the COVID-19 pandemic continues, we feature two programs that continue to meet mission demands, see page 38 for how they have adapted.

On the back cover: *Aviation Ordnanceman 3rd class Tierra Brown inspects ordnance in the hangar bay of Nimitz-class aircraft carrier USS Carl Vinson (CVN 70) Nov. 8. (U.S. Navy photo by MCS Megan Alexander)*

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

A Marine Corps CH-53E Super Stallion, with Marine Medium Tiltrotor Squadron (VMM) 265 (reinforced), prepares to lift a Joint Light Tactical Vehicle during helicopter support team training on Landing Zone Swan on Okinawa, Japan, in September.

U.S. Marine Corps photo by Pfc. Joseph E. DeMarcus

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Airscoop

Compiled by Andrea Watters and Rob Perry

School of Aviation Safety Becomes a Command

NORFOLK, Va.—The Naval School of Aviation Safety (SAS) was designated an Echelon 3 command under the Naval Safety Center (NAVSAFECEN) during a ceremony in October 2021 at the schoolhouse onboard Naval Air Station Pensacola, Florida.

The school, which aligned under NAVSAFECEN in 2013, trains aviation officers in several areas of safety, including hazard identification, risk management, mishap reporting and investigation, and how to assist the fleet with safety matters.

Rear Adm. F.R. "Lucky" Luchtman, NAVSAFECEN commander, attended the ceremony and recognized the work and dedication of SAS in its critical mission to provide quality safety training to aviators.

"SAS becoming a command means that Naval Aviation and the Naval Safety Center are taking the schoolhouse very seriously," Luchtman said. "So much so that we decided to make it unique among all of the services in that we are the only community that now has an O-6 command training our safety officers."

Capt. Scott Janik, who reported to SAS in September 2021, said it was humbling to become the school's first commanding officer and an honor to be a part of SAS.

"Our professionals, both military and civilian, take great pride in the impact we have in educating commanding officers and safety leaders with the goal of seamlessly integrating safety into our daily operations," Janik said.

One of the more unique ways SAS is able to leave an impact—and emphasize the importance of safety to its students—is through the use of its "crash lab," a large hangar that houses various types of aircraft previously involved in mishaps. Essentially, the crash lab contains actual mishap aircraft exhibits that provide a realistic scene for students to analyze and apply the investigative techniques and procedures taught in the classroom.

U.S. Navy photo by Cmdr. Zachary Miller

Rear Adm. R.R. "Lucky" Luchtman, Naval Safety Center commander, receives a mission brief from Marine Corps Maj. Kyle Ladwig, Naval School of Aviation Safety (SAS) investigations instructor, during a tour of the schoolhouse with SAS's new Commanding Officer, Capt. Scott Janik.

"We understand the importance to the fleet of providing this education," Janik said.

Through lessons learned and experience gained from the past, the new SAS commander said the school will continue to impart this critical knowledge on future naval aviators to protect our most valuable resources.

"It is our goal to ensure our people operate safely and effectively while executing their warfighting tasks—to keep themselves, our assets and our Navy mission-ready," Janik said.

Written by Amy Robinson, Naval Safety Center Safety Promotions.

Two Naval Test Wing Atlantic Squadrons Earn Coveted Safety Awards

PATUXENT RIVER, Md.—The United States Naval Test Pilot School (USNTPS) and Air Test and Evaluation Squadron (HX) 21 received the Safety "S" for earning the 2020 Chief of Naval Operations (CNO) Aviation Safety Award Nov. 3.

Vice Adm. Carl Chebi, Commander, Naval Air Systems Command, presented the awards during back-to-back ceremonies at the respective squadrons, both based at Naval Air Station Patuxent River, Maryland.

The award and the safety "S" displayed on each of the squadron's aircraft recognizes the squadron for excellence in aviation safety by maintaining Class A mishap-free safety records throughout the fiscal year and making contributions to the Naval Aviation Safety Program. A Class A mishap is when a pilot or crew suffers death or disability, or at least $1 million in property damage.

Earning this award requires a culture of safety inclusive of everyone in the command. Safety leaders pointed to respect for the "no vote"—a policy that allows anyone to cancel a flight for any reason—as foundational to their safety record, along with engagement from every level.

"It takes dedicated, experienced individuals to make a safety program work," said Col. Richard Marigliano, Commodore, Naval Test Wing Atlantic (NTWL). "At USNTPS, Lt. Cmdr. William Vey and Barbara Gordon; at HX-21, Lt. Trey Wheeler and Doug Dickens, provide safety program leadership and focus, ensuring ground and flight test risk is appropriately mitigated. These two safety programs and the individuals that execute day-to-day safety functions ensure continued accomplishment of NTWL's mission supporting our nation's warfighters."

Maintaining the highest levels of safety is difficult in any environment, but particularly challenging in squadrons that routinely push aircraft beyond their limits in order to provide new fleet capabilities.

From Naval Air Warfare Center Aircraft Division Public Affairs.

U.S. Navy Photo by Peter Fitzpatrick

The U.S. Naval Test Pilot School safety team, Barb Gordon and Lt. Cmdr. William Vey, are joined by the school's Commanding Officer, Cmdr. Jeremy DeBons, and Commander, Naval Air Systems Command, Vice Adm. Carl Chebi, after presentation of the Chief of Naval Operation's Aviation Safety Award at Naval Air Station Patuxent River in November.

UAS Demo Displays Potential for Future Cargo Resupply

ST. INIGOES, Md.—The Navy and Marine Corps may soon have a way to resupply warfighters on the front line using unmanned systems capable of delivering necessary supplies from a distance in a variety of scenarios.

The DoD is considering several cargo resupply systems and recently demonstrated these capabilities to senior leadership during an event Oct. 27 at the Naval Air Warfare Center Aircraft Division's (NAWCAD) Webster Outlying Field (WOLF).

The Navy and Marine Corps Small Tactical Unmanned Aircraft Systems Program Office and NAWCAD coordinated this event where operators from Air Test and Evaluation Squadron (UX) 24 performed multiple resupply missions. The event was a two-part demonstration flying both the Tactical Resupply Unmanned Aircraft System (TRUAS) TRV-150 and Blue Water logistics UAS (BWUAS).

TRUAS is a Marine-focused platform for tactical resupply primarily on shore. It has a shorter range than Blue Water, but a heavier lift around 150 pounds. It's intended to transport items like food and tactical gear to Marines in the field. Blue Water is a Navy-focused platform for resupply at sea. It has a longer range, and a smaller footprint to better fit onto ships. Its cargo capacity is smaller than TRUAS at 30-50 pounds.

"The demonstration highlighted the basic capability of the systems to operate autonomously, to have mission plans uploaded and to execute the flights with little to no input while they were in the air," said Cmdr. Seth Ervin, UX-24 chief test pilot.

"These systems have to be transportable, so they have to come in cases and they have to be expeditionary," Ervin said. "And that was really the focus of today, to walk through, in a fairly quick fashion, and show how easy it is for a basically trained Marine or Sailor to get the system out of a box, to get it set up, to get it uploaded and hit go."

Ervin's team demonstrated the capabilities of a land and air drop using the TRV-150 and different payloads. For the first mission they did an air drop, where the system flew to a pre-programmed point, dropped the payload and flew back. During the second leg, the TRV-150 flew to specified coordinates, landed and released the payload. The operator on the ground retrieved the package and once it was safely out of the way, the operator pressed a button to return the UAS to its location.

Operators then flew BWUAS to demonstrate a vertical takeoff, transition to forward flight and then back to vertical take off/landing for an air drop. The system then transitioned back to forward flight and returned with a vertical landing.

"Unmanned logistics supply aircraft will keep Sailors and Marines out of harm's way and can provide much needed logistics support and assistance with humanitarian relief efforts," said Rear Adm. Brian Corey, Program Executive Officer for Unmanned Aviation and Strike Weapons. "With unmanned assets, we have a resupply that will be much more effective and give our operators the ability to maneuver around the battlefield in ways they haven't been able to do before."

Both the TRUAS and BWUAS teams are working closely with their Marine Corps and Military Sealift Command counterparts to rapidly bring these systems to the warfighter through innovative, non-traditional acquisition strategies.

The program office, in collaboration with the Naval Air Systems Command's AirWorks, IMPAX, WOLF and other contracting teams, used other transaction authorities (OTAs) to quickly execute TRUAS. OTAs give the program the ability to make ongoing changes to the prototype based on the users' input significantly reducing development time compared to a traditional acquisition program. The TRV-150 will be delivered to Marines as part of an extended user assessment in summer 2022.

NAWCAD is also using OTAs to prototype BWUAS technology and demonstrate feasibility of autonomous tactical resupply at sea. Future system development will include improvements to the artificial intelligence and machine learning technology required for autonomous ship-based recovery, folding wings for improved wind and deck handling, and in-flight battery charging.

The vision is to have a family of unmanned cargo resupply systems for the Navy and Marine Corps—some on the ground and some in the air, Corey said.

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

U.S. Navy photos

A Navy-focused platform for resupply at sea, a Blue Water Unmanned Aircraft System (UAS) takes off from Webster Outlying Field (WOLF) in Maryland on Oct. 27 during a cargo resupply demonstration.

A TRV-150 Tactical Resupply UAS also participated in the demonstration as it flies over WOLF.

U.S. Marine Corps photo by Lance Cpl. Quince Bisard

An MV-22B Osprey pilot with Marine Medium Tiltrotor Squadron (VMM) 166, Marine Aircraft Group 16, 3rd Marine Aircraft Wing, flies in formation during the final flight of the squadron in California, June 30, 2021.

VMM-166 Deactivates

MIRAMAR, Calif.—Marine Medium Tiltrotor Squadron (VMM) 166, Marine Aircraft Wing 16, 3rd Marine Aircraft Wing, gathered one last time at Marine Corps Air Station (MCAS) Miramar, California, as the colors were cased during a deactivation ceremony Oct. 1, 2021.

VMM-166 conducted its final flight on June 30, 2021. After 36 years of deploying in support of many American military operations ranging from Desert Storm to Inherent Resolve, VMM-166 "SeaElk" will deactivate as personnel and equipment are re-organized to various Marine squadrons throughout the continental United States.

"As part of Force Design 2030, the Marine Corps is deactivating several units as a divestment to invest in other platforms," said Lt. Col. James Clifford Ford III, Commanding Officer of VMM-166. "We aren't fighting in the Middle East, we are preparing for near-peer adversaries with some of the same technology as us."

Force Design 2030 is a plan that further prepares the Marine Corps to continue to stand as the nation's naval expeditionary force-in-readiness, while simultaneously modernizing assets in accordance with the National Defense Strategy. Reducing the number of Marine Corps squadrons that maintain and fly the MV-22B Osprey allows the Marine Corps to consolidate its resources while paving the way for emerging aircraft technologies. Force Design 2030 ensures the Marine Corps adapts to emerging tactics and technologies while maintaining its identity as the world's premiere expeditionary force.

The Marines and machines of VMM-166 are being disbursed throughout the Marine Corps, while many will remain in MCAS Miramar.

VMM-166 was activated on Sept. 13, 1985. Since then, VMM-166 has contributed to countless sea and land operations earning several honors and awards including the Iraqi Campaign Streamer with two Bronze Stars, Global War on Terror Expeditionary Streamer and the National Defense Service Streamer with one Bronze Star.

"This has been the most difficult and most rewarding experience I've ever had," said Ford, regarding his time with SeaElk. "It has been outstanding to see how hard and passionately Marines can work."

Written by Cpl. Levi Voss, 3rd Marine Aircraft Wing.

First Marine Corps F-35C Squadron Deploys

MIRAMAR, Calif.—Marine Fighter Attack Squadron (VMFA) 314 of 3rd Marine Aircraft Wing (MAW) marked a key milestone when they departed San Diego Bay with Carrier Air Wing (CVW) 9 aboard USS Abraham Lincoln (CVN 72) as the first Marine squadron to deploy the F-35C Lightning II on an aircraft carrier.

"The Black Knights' deployment of F-35C Lightning II aboard USS Abraham Lincoln is the newest chapter in the Marine Corps' long history of naval integration," said Maj. Gen. Bradford J. Gering, 3rd MAW commanding general. "The upcoming deployment represents years of hard work and innovation by the Marines and Sailors of VMFA-314, MAG-11 and 3rd MAW. It also reinforces our commitment to fielding the most lethal and ready Navy-Marine Corps force as we project warfighting capabilities throughout the Indo-Pacific region, or globally wherever our nation calls."

The Marine Corps deployment of the F-35C is significant as the F-35C was designed and built specifically for aircraft carrier operations and brings with it the ability to enhance the inherent battlespace awareness of all naval aircraft it operates alongside. Deploying this asset in a contested maritime region provides the Marine Corps a flexible, mobile force that provides security to the United States and allied nations abroad, contributes to regional stability and expands the U.S. military advantage at sea.

Third MAW recently demonstrated the F-35's strike capabilities by utilizing its F-35 squadrons in long-range aerial strike exercises. During Exercise Summer Fury 21, a 3rd MAW squadron flew the F-35 from Miramar, California, to Washington State, a distance of more than 1,000 miles, to deliver long-range precision fires on a designated target.

"Our ability to operate the F-35C in the Pacific greatly increases the Marine Corps' naval expeditionary force capabilities by providing us the capacity to employ the most advanced electronic warfare capabilities on any aircraft today in support of fleet operations," said Lt. Col. Brendan M. Walsh, VMFA-314 Commanding Officer.

This deployment comes as a culminating effort as VMFA-314 completed its workups last year with CVW-9 onboard USS Abraham Lincoln, concluding with VMFA-314 completing their final integrated training cycle along other elements of Carrier Strike Group 3 in December as the Marine Corps continues to develop its fifth-generation strike fighter capabilities.

VMFA-314 was the first Marine Corps squadron to transition to the F-35C variant after retiring its legacy F/A-18A/C Hornet aircraft and receiving its first F-35C on Jan. 21, 2020.

Written by 1st Lt. Charles Allen, 3rd Marine Aircraft Wing public affairs.

U.S. Marine Corps photos by 1st Lt. Charles Allen

F-35C Lightning II, assigned to Marine Fighter Attack Squadron (VMFA) 314, arrive aboard USS Abraham Lincoln (CVN 72) as they prepare to deploy alongside the Navy as an integrated part of Carrier Strike Group 3.

Contest Leads to Improvements for TACAMO

U.S. Air National Guard photo by Tech. Sgt. Amy M. Lovgren

The Airborne Strategic Command, Control and Communications Program Office selected a proposal for an aircrew firefighting and rescue program that will work to provide TACAMO's aircrew with the knowledge, skills and tools necessary to maximize their potential for a positive outcome in various emergency scenarios.

PATUXENT RIVER, Md.—New approaches to firefighting and increased reporting time on the E-6B Mercury subsystems came as a result of innovative ideas from Sailors during a recent contest.

The airborne command, control and communications community came together for a contest designed to stimulate innovative thinking and allow everyone the opportunity to pitch their ideas. Two promising ideas that could move to prototype in fiscal year 2022 were selected.

Over 15 weeks, Capt. Adam Scott, Airborne Strategic Command, Control and Communications Program manager, and Capt. Cedrick Jessup, Strategic Communications Wing One commodore, reviewed 11 submissions over three rounds before making their selections.

The winning ideas were from Lt. Andy Husted for his aircrew firefighting and rescue program and Lt. Cmdr. Clinton Turner for his virtualized situation monitoring.

"The process was great and a fantastic tool for the community to bring a wide range of ideas and diverse viewpoints from different occupations straight to the upper leadership," said Husted, Fleet Air Reconnaissance Squadron (VQ) 7 instructor pilot.

Husted's program will provide TACAMO's aircrew with the knowledge, skills and tools necessary to maximize the potential for a positive outcome in various emergency scenarios.

Before joining the Navy, Husted was a firefighter/emergency medical technician.

"Using my background, I discovered training and operating deficiencies that do not properly prepare our crews for in-flight fires or rescue situations," he said. "Creating competent aircrew firefighting and rescue operators could make the difference between a successful landing and evacuation, and the complete loss of an aircraft and its occupants."

Since having his idea selected, Husted has formed a development team comprised of members from each aircrew position. This team is working with the local fire department to coordinate aircrew firefighting training in an aircraft smoke simulator as well as providing the fire department members with further training on the E-6B Mercury.

Acquisition of emergency equipment and training devices has begun and the team is currently working on the process for jet implementation. They will continue to develop a training program and hope to have full community execution within a year.

"Even though only a few weeks have passed since the conclusion of the final round, there has already been a quantifiable improvement in our operations," Husted said.

Turner's idea is to virtualize one of the services onto the E-6B to modernize and reduce subsystem capability impact reporting time.

He came up with the idea while streaming a movie and realizing how little bandwidth was needed.

"I was thrilled to learn my idea was one of the selections," said Turner, U.S. Fleet Forces Command staff officer. "I really enjoyed the process because it opened up a smart dialog of innovation among some very talented community stakeholders."

Both winning proposals will continue to be developed/implemented throughout the next year and beyond.

"The commodore and I are excited about what the future holds for these innovative ideas," Scott said.

Some of the proposals during the contest were too large in scope and were sent to their appropriate working groups for possible inclusion in future Naval Aviation Requirements Groups.

With the success from this initial event, another contest is being planned for this fiscal year with the hope of an even bigger turnout.

"We know the Sailors supporting our community have ideas that can make us better," Scott said. "The contest this year showed they just need a forum to bring them forward."

From the Airborne Strategic Command, Control and Communications Program Office.

Israel to Purchase CH-53K King Stallion

Courtesy of Sikorsky, a Lockheed Martin Company

An artist rendering of a CH-53K helicopter for the Israeli Air Force.

PATUXENT RIVER, Md.—The Israeli Air Force (IAF) signed a Letter of Acceptance Dec. 30 with the United States government to purchase the CH-53K King Stallion heavy lift helicopter.

"We're happy the IAF recognizes the unrivaled capabilities and performance of the K and have chosen to move forward with us," said Col. Jack Perrin, H-53 Heavy Lift Helicopters Program manager. "Welcome to the CH-53K family."

The CH-53K is the most powerful helicopter ever built by the U.S. government and will replace the IAF's current fleet of modified CH-53D Yasur helicopters, which have been flying for more than 50 years.

The signed agreement states first deliveries of the aircraft are planned for 2025. In addition to the aircraft, the agreement includes T408-GE-400 engines; facilities study, design and construction; spare and repair parts; support and test equipment; publications and technical documentation; aircrew and maintenance training; U.S. government and contractor engineering, technical and logistics support services; and other related elements of logistics and program support.

As the long-range logistic support backbone for the U.S. Marine Corps, the CH-53K will support Israeli special operations programs first, as well as provide the Israeli Defense Forces with a platform that has the speed, safety and gross weight capability to support all of its missions, including troop and cargo transport, and search and rescue.

The decision wraps up a multi-year negotiation process. In the end, the King Stallion offered more capabilities and the latest technology compared to the competition.

The CH-53K King Stallion program is in the Initial Operational Test and Evaluation stage and is on track to achieve Initial Operational Capability early 2022, with first fleet deployment planned for fiscal year 2024.

From the H-53 Heavy Lift Helicopters Program Office.

Harvey Named National Academy of Inventors Fellow

U.S. Navy photo

CHINA LAKE, Calif.—Dr. Benjamin Harvey, senior research chemist with Naval Air Warfare Center Weapons Division (NAWCWD), was named a Fellow of the National Academy of Inventors on Dec. 7.

The NAI Fellows Program highlights inventors who have demonstrated a spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development and the welfare of society. To date, NAI Fellows hold more than 48,000 issued U.S. patents. The current Fellow class collectively hold 4,800 issued patents.

Harvey himself holds 78 patents, with several more pending. But he's not done pushing yet.

"I think many scientists are driven by the question 'What if,'" he said. "That thirst for understanding drives me to discover new molecules, materials and processes to address pressing Navy needs."

He said that because Navy laboratories are not in the business of producing materiel, it's critical to publish, patent key technologies and work with industry partners to enable commercial development.

Harvey didn't get here alone, and he credits his colleagues, mentors, supervisors and patent attorneys for the collaborative effort to advance science and technology for the nation's military service members.

"I'm incredibly humbled to be selected for this honor. Everything we do in the research department is designed to provide enhanced capabilities to the warfighter, so my hope is that the breakthroughs we've made will help the U.S. Navy maintain its technical advantage," he said.

Harvey and the rest of the 2021 new Fellows will be inducted at the Fellows Induction Ceremony at the 11th Annual Meeting of the National Academy of Inventors June 2022 in Phoenix, Arizona.

From Naval Air Warfare Center Weapons Division Public Affairs.

Exercise Gray Flag Integrates Testing

POINT MUGU, Calif.—Test and tactics came together at Naval Base Ventura County Point Mugu, California, in August, filling the Southern California skies with aircraft from across the services and across the country for the annual Exercise Gray Flag event.

The large force exercise has its roots in events previously known as Tactics Development and Evaluation and Verification and Validation evolutions.

Operating over Naval Air Warfare Center Weapons Division's (NAWCWD) Point Mugu Sea Range and R-2508 airspace, Gray Flag provides a location, security environment and relevant platforms that allow for integrated system-of-systems testing by developmental and operational testers. Additionally, with the inclusion of Naval Air Warfare Development Center (NAWDC), the exercise provides a venue for tactics development test and evaluation for the Joint Force well ahead of planned fleet incorporation of the newest hardware and software. The exercise focuses heavily on interoperability, leveraging airborne and surface fleet assets.

Capt. Ryan Bryla, commodore for Naval Test Wing Pacific, highlighted that the exercise also aligns multiple objectives and integrates across carrier air wing planning and the system development life cycle.

U.S. Navy photo

An F/A-18F from Air Test and Evaluation Squadron (VX) 9 flies over Naval Base Ventura County Point Mugu, California, on Aug. 24. VX-9 was one of several squadrons participating in Exercise Gray Flag in mid-August.

"We use a Capability-Based Test and Evaluation Model, which focuses on continuous evaluation and improvement of a system or system-of-systems in a mission context," Bryla said.

Gray Flag combines test, targets and other assets available at Point Mugu and surrounding installations to evaluate systems-of-systems capabilities in a centralized, realistic, integrated environment, rather than focusing on meeting individual technical specifications in a vacuum.

"Not only does Gray Flag provide a test venue where each program can bring their developing capability, but it also allows for collaboration across the continuum of test because the test and range assets are here in one place," said Capt. Will McCombs, Commanding Officer, Air Test and Evaluation Squadron (VX) 9. "We've got fledgling Developmental Test efforts working with more mature capabilities that need a realistic combat environment for Operational Test."

McCombs said that having all of these test assets in a single venue is more efficient, because it allows cross platform integration that would otherwise be difficult to achieve.

"With NAWDC's participation, the tactics gurus are getting exposure to these capabilities sooner, jumpstarting their tactical recommendations for fleet users," he said.

Written by Kimberly Brown, Naval Air Warfare Center Weapons Division Public Affairs.

U.S. Navy photo

An E-2C Hawkeye, assigned to Airborne Command & Control Squadron (VAW) 117, powers up on the flight line during Exercise Gray Flag.

Grampaw Pettibone

Gramps from Yesteryear: January-February 2002

Illustration by Ted Wilbur

A Deadly Stew

An F/A-18 Hornet pilot was the leader of a night, two-plane, close air support (CAS) flight using night vision goggles. The flight was under the control of a ground-based forward air controller (FAC) and was considered a precursor to the start of a structured training regimen.

During the briefing, the FAC offered the flight a preplanned CAS mission with a hard time on target, which was accepted. The flight launched, entered the target area and made two orbits to familiarize themselves with the range before proceeding to the initial point.

The leader was behind on his timeline to make the assigned time on target and was traveling at 520 knots indicated airspeed vice the prebriefed 300. He climbed through the 9,000-foot altitude restriction outside the target complex in an effort to attain the apex of his popup maneuver. Still behind the timeline, the flight reached an apex 1,200 feet below the required altitude and 120 knots too fast.

The target was a tank in the live impact area, denoted by the FAC using an infrared marking device. The leader was cleared but did not drop. He had not set proper altitude warning cues and passed the release altitude in a steep dive. He designated the target and initiated a normal pullout. Approximately three seconds later he was seen to execute a maximum performance G-limiter pull to attempt recovery. The aircraft cleared the target and was in a nose-up attitude and climbing when the Hornet struck a small ridge northeast of the tank. There was no attempt at ejection. The pilot and the aircraft were lost.

Grampaw Pettibone says …

Loss of situational awareness, target fixation, hurrying to catch up—that's an awful mix in anyone's stew. There are times when tryin' too hard spells disaster. The pilot didn't fly the briefed pattern, didn't set the proper altitude warning cues, and pressed on when an abort mighta been the better option. Also seems like the seniors in the chain accepted the CAS mission tasking too early in the training deployment. Terrible loss.

True Confessions

Editor's Note: In support of the fleet, Naval Aviation News is now publishing "True Confessions" from naval aviators to share lessons learned. If you have an event to share, have your squadron safety officer and commanding officer approve your True Confession before submitting to the NAN.

U.S. Navy photo illustration by Fred Flerlage; photographic image by MC2 Mark Thomas Mahmod

Launch Bar Lessons Learned

From Strike Fighter Squadron (VFA) 131

After nearly two weeks out of the cockpit due to post deployment leave, I was scheduled for a "good deal" Monday morning tactical intercept flight and was looking forward to the event. Following an uneventful brief, walk, launch and overall flight, my thoughts turned to a safe recovery and getting back to other items I needed to work on that day.

After landing rollout, I exited the runway and began to reconfigure the aircraft per the Naval Air Training and Operating Procedures Standardization (NATOPS) post-landing checklist, setting the ejection seat to "Safe," the flaps to "Auto" and the landing/taxi light to "Off." As I executed a left turn onto the main taxiway, I noticed the jet was difficult to steer and it took significantly more rudder input than usual to generate the desired turn rate with—what I thought at the time—high gain nosewheel steering (NWS).

After taxiing for a short distance, it became clear there was an issue with the aircraft, so I stopped on the taxiway and called the Squadron Duty Officer on the base radio to start troubleshooting. My initial thought was that I had blown a tire, so I advised ground crew of the possibility of foreign object damage (FOD) on the runway and adjoining taxiways. After a short time, my flight lead was able to look back at my aircraft and noticed that while my flaps were up, my taxi light was still on. She immediately suggested I check the status of my launch bar switch and I was surprised to see it was in the "Down" position and my landing/taxi light was still in the "On" position. I put the launch bar back up, coordinated with base to get a tow in case there was any damage to the NWS system and advised ground there was no longer a FOD concern.

Looking back at the episode there were a few contributors to the incident and ultimately a good lesson learned for other aviators to take away.

Wrong Switch: Different but Same

In reconstructing the chain of events during the debrief, I concluded that after crossing the hold short line, I began my normal post-landing checklist where my first step is to place the ejection seat handle to the "Safe" position. Next, I raised the flaps and attempted to turn off the landing/taxi light. In the F/A-18A-G, the landing/taxi light and launch bar switches are roughly similar in shape with the launch bar switch being smooth and located directly below the landing/taxi light switch.

Since these two switches are located in approximately the same location and are roughly similar, the landing taxi light switch has two small "domes" on it to help differentiate it from the launch bar switch by feel. Additionally, the launch bar switch requires the pilot to pull it out of a detent prior to moving it to the up or down position. In my attempt to turn off the landing/taxi light, I had inadvertently grabbed the launch bar switch and placed it in the "Down" position. When the switch is placed in the "Down" position, normal NWS is immediately disengaged and can only be re-engaged by depressing the NWS button on the stick. Normally, pressing and holding the NWS button a second time will provide high gain NWS, but with the launch bar down, the pilot can only select a maximum of low gain NWS. Since the launch bar was now down, I was only able to select low gain NWS even with the high gain NWS button depressed and held. This is what led to my assessment that I wasn't generating the desired turn rate with high gain NWS indicating there may be an issue as I started my turn onto the main taxiway.

U.S. Navy photo

This control panel of an F/A-18 Super Hornet shows the location and proximity of the launch bar and the landing/taxi light.

Worst Case Scenarios

While the overall event may seem minor and no damage or injury resulted, it is important to remember that it could have ended very differently. As I cleared the runway and began taxiing at 10 knots, I put the launch bar down which disengaged the NWS at a key moment. The airfield had several ongoing taxiway repair projects with barricades in a number of locations including the taxiway I was on. I was in a turn when my NWS disengaged which caused my nose wheel to track straight and the aircraft nearly ran into several of these low-lying barricades. This could have caused damage to the aircraft's tires and landing gear and potentially led to engine FOD damage if any pieces had been ingested into the intakes.

On a more extreme note, a significant mishap did occur in March 2004 at Naval Air Station Lemoore, California, when an aircraft was flipped onto its back during the landing rollout. In the post mishap investigation, it was determined that the pilot reconfigured the aircraft prior to clearing the runway. Like me, instead of placing the landing/taxi light to the "Off" position, he inadvertently put the launch bar down and subsequently picked up the long field arresting gear with the lowered launch bar. The result was the aircraft being violently flipped over and coming to rest upside down. Luckily there was no post-crash fire, and the pilot was extricated from the aircraft with only minor injuries. Due to this mishap and general good headwork to prioritize pilot focus on controlling the aircraft during landing rollout, the combined Strike Fighter Wing Atlantic and Pacific standard operating procedure (SOP) dictates that there shall be no changes to aircraft configuration while the aircraft is on the runway.

In my case, by following this protocol, my mistake occurred at a relatively low speed, and I was able to detect my error prior to any major damage being done. If I had made this mistake while still on the runway and at a higher speed, the result could have been catastrophic. In a number of cases our SOPs are "written in blood," similar to many NATOPS procedures, and this SOP item potentially spared me a more serious result.

The big lesson learned is that a flight is not over until the aircraft is safely shut down and you're standing at the bottom of the boarding ladder. Second, complacency and distraction have no place in the cockpit, especially in a single seat cockpit where the pilot is the sole source for "checks and balances."

Some other key takeaways that contributed to my error were that I had recently returned from deployment, so I was still knocking the rust off of my ashore procedures and habit patterns. Since the taxi/landing light is not used in the aircraft carrier environment (except during an emergency) its use was still outside my normal habit patterns with my limited recent ashore flying. Additionally, this was only my fifth flight in the last 30 days with overall flight hours totaling less than six hours so I was well below the tactical hard deck with regard to hours flown. We often consider currency verses proficiency for tactical execution, but not as often for simple NATOPS procedures. I did adhere to my normal post-landing habit patterns and was mindful not to initiate any configuration changes until after exiting the runway which was critical to preventing a potential mishap or damage to the aircraft.

In the end, seemingly small or insignificant tasks and deviations from our standard procedures and habit patterns could have substantial consequences. Slow down, be careful, be deliberate and fly safe.

Submitted by Lt. Cmdr. Greg "Shinique" Carter, Strike Fighter Squadron (VFA) 131 Safety Officer.

Navy Completes Initial Carrier Demo for MQ-25 Program

From Program Executive Office (Unmanned & Weapons) Public Affairs

U.S. Navy photo by MC3 Brandon Roberson

T1, the Boeing unmanned MQ-25 test aircraft, rests on the flight deck aboard aircraft carrier USS George H.W. Bush (CVN 77).

U.S. Navy photo by MC3 Hillary Becke

T1 taxis on the flight deck aboard CVN-77.

U.S. Navy photo by MC3 Brandon Roberson

The MQ-25 aircraft is towed on the flight deck.

U.S. Navy photo by MC3 Brandon Roberson

T1 is given a diagnostics test on the flight deck.

The Navy completed an Unmanned Carrier Aviation Demonstration (UCAD) of its MQ-25 unmanned air system prototype in December aboard USS George H.W. Bush (CVN 77), laying the groundwork for future carrier-based unmanned aircraft system (UAS) operations.

The government team, along with industry partners Boeing and Lockheed Martin, conducted a demonstration aboard the carrier with both ground control system (GCS) and aircraft to evaluate the MQ-25 system's integration into the carrier environment.

"There is no better way to determine the success of a carrier aircraft design and its integration into the air wing than to put that new aircraft through testing at sea," said Capt. Chad Reed, Unmanned Carrier Aviation (UCA) program manager. "I am extremely proud of our team for the stellar execution of both engine and aircraft tests, as well as the approaches flown in a surrogate aircraft. It's an exciting time as we progress toward the air wing of the future."

During the in-port portion of the UCAD, Lockheed Martin installed the prototype MD-5 ground control station in the Unmanned Aviation Warfare Center (UAWC), the CVN-based control room. The team specifically demonstrated the functionality of the GCS to the MQ-25 fleet integration team, giving them the opportunity to assess design constraints driven by shipboard installation and capture feedback on human system interfaces.

"This was the first opportunity to have the MD-5C prototype control station installed in the UAWC," said Cmdr. Karl Orthner, UCA mission control station installation lead. "It gave the chance for leadership, test pilots and future air vehicle operators to experience the look and feel for how the MQ-25 will operate onboard a carrier as well as inform the program office on items to consider for future UAWC layout development."

Once underway, the MQ-25 test asset, known as T1, completed a series of test points evaluating the functionality and capabilities of the deck handling system during both day and nighttime operations. Maneuvers included taxiing and parking on the flight deck, connecting to the catapult and clearing the landing area. Data was collected related to deck motion and wind-over-deck impacts to controllability and the propulsion system.

The team also coordinated the first Joint Precision Landing System surrogate flight with a Beechcraft King Air. Ship motion data collected during these first representative hardware and software approaches will be extremely valuable in refining the software, Reed said.

MQ-25 "deck operators" used Boeing's new Deck Control Device (DCD) during all phases of the deck handling system evaluation. The deck operators were co-located with the Navy taxi directors (yellow shirts) and provided the corresponding control inputs on the DCD responding to the yellow shirt's taxi directions.

"Early testing allowed our team the opportunity to evaluate many new systems for the first time at sea with T1," Reed said. "Our initial look at taxi operations on the flight deck successfully demonstrated the MQ-25's ability to maneuver just like a manned aircraft in the shipboard environment."

When operational, the director and deck operators will be able to taxi the MQ-25 on the carrier flight deck to the catapult launch position and to a parking location after landing. The MQ-25 will be controlled while airborne from the UAWC where the air vehicle operator executes a pre-planned mission.

The MQ-25 will be the world's first operational, carrier-based unmanned aircraft and is integral to the future carrier air wing (CVW). It will provide an aerial refueling capability that extends the range, operational capability and lethality of the CVW and its carrier strike group.

U.S. Navy photo

Cmdr. Kelly Varonfakis is the first female full-time support Aerospace Maintenance Duty Officer selected for the rank of Navy captain last summer.

Varonfakis Breaks Barriers as First Female FTS AMDO Captain

By Teri Heisler

History was made in July as Cmdr. Kelly Varonfakis became the first female full-time support (FTS) Aerospace Maintenance Duty Officer (AMDO) selected for the rank of captain.

The Navy selected Varonfakis for the O-6 grade, breaking a barrier in place since the FTS AMDO community was established 31 years ago. Assigned to Commander, Fleet Readiness Centers (COMFRC) Headquarters, she is the Vertical Lift Production Lead and oversees aircraft and engine production for all Navy and Marine Corps rotary aircraft.

"I am honored to be among a phenomenal group of women leaders who are true trailblazers—women like Cmdr. Deb Vavrus, who started as an aviation structural mechanic and served for 35 years until her retirement. I am grateful for her faith-forward leadership and mentorship and the path she forged," Varonfakis said.

Rear Adm. Joseph Hornbuckle, COMFRC, lauded this historic moment and noted there is still work to be done.

"Capt. Varonfakis is a testament to the kind of resilience and fortitude needed to be successful. It is an honor to celebrate her ingenuity and expertise. This historic selection is something to be celebrated and built upon."

As the Navy's senior ranking AMDO, COMFRC Vice Commander Capt. Christopher Couch reflected on what this significant milestone means to the community.

"Cmdr. Varonfakis' selection to captain is just beginning to tap the potential to bring further diversity to the aviation maintenance community," he said.

As Vertical Lift Production Lead, Varonfakis leads two integrated product teams (IPT) which include aircraft and engine production of the Navy and Marine Corps rotary variants.

In addition to managing COMFRC's production effort, Varonfakis works with nine Fleet Readiness Center (FRC) sites and their stakeholders to eliminate barriers and lean forward to address and mitigate future constraints. She also represented depot interests on a Secretary of the Navy-directed joint task force; Deputy, Assistant Secretary of the Navy working groups; and has provided data and analysis used for House Armed Senate Committee briefings.

"The depots are incredible at what they do, and it is an honor to represent them. Their desire to support our Sailors and Marines often requires them to work under less-than-optimal conditions including poor material condition of aircraft as they come in, shortages of parts and unpredictable schedules. These obstacles and other compounding factors can lead to unavoidable delays," Varonfakis said.

The V-22 Osprey, H-53 Sea Stallion and H-60 Seahawk aircraft are currently in various stages of Naval Sustainment System-Aviation (NSS-A) implementation. The goal of NSS-A is to transform both readiness and sustainment of all aircraft. FRCs have achieved substantial improvements in workspace layouts, turnaround times for maintenance, unfilled customer orders and deliberate planning for future activities.

"Her work on the H-60 team has been instrumental in fully integrating the Naval Sustainment System for this type/model/series," Hornbuckle said.

"To see how each production line is empowered to take control, and demand and receive the support they need is rewarding to witness as this effort unfolds," Varonfakis said.

Being a trailblazer in the AMDO community is especially meaningful for Varonfakis given her early commitment to the Navy.

"I was in the second grade when I first declared I wanted to join the Navy," she said. "I didn't grow up far from Naval Air Station Miramar and could see the jets flying overhead. I loved it. I don't recall anyone encouraging me, but instead was told time and again, 'No sweetie, girls don't do that.' I am both thrilled at the progress we have made as a country and Navy, but am appalled there are still so many barriers, and ceilings left to break."

Teri Heisler was the acting public affairs officer for Commander, Fleet Readiness Centers.

Editor's Note: This special section celebrates the contributions women vanguards in Naval Aviation have historically made and continue to make toward mission success. Naval Aviation News is proud to feature a small sample of these warfighters and is always looking for profiles of exceptional men and women serving in the U.S. Navy.

Price-Jordan Cites Mentors in Selection as First Black Woman FTS AMDO Captain

By Valerie Doster

Cmdr. Deserine Price-Jordan was recently selected to serve as the highest-level officer in one of the Navy's Aerospace Maintenance communities.

Price-Jordan, Tactical Airlift Program Office's Fixed Wing/Operational Support Aircraft (VR/OSA) deputy program manager, will become the first black female full time support (FTS) Aerospace Maintenance Duty Officer (AMDO) to be promoted to the rank of captain. This barrier-breaking achievement puts Price-Jordan at the highest level in the FTS AMDO community.

Price-Jordan attributes hard work, taking great care of the people you work with and having great mentors as her recipe for success. The pursuit of excellence will transcend a person's race and gender, Price-Jordan said.

"I have always believed that if you have the ability and apply yourself to a goal, you can achieve anything you want," she said. "I also believe in the power of mentorship; too often young or junior team members don't have someone to look up to, someone who has accomplished something they can see themselves doing in the future. I was lucky and had great mentors and role-models and I am honored to become that person for others."

Price-Jordan's first 16 years in the Navy were spent in various air traffic control positions. She earned a bachelor of science degree in professional aeronautics in 1997, and the same year, was selected as Air Traffic Controller of the Year, then Sailor of the Year and was, subsequently, promoted to chief petty officer.

Price-Jordan was inspired by one of her role models, her cousin, Army Chief Warrant Officer Wanda Phillips, who remained a mentor throughout her career. Phillips retired as chief information systems technician after 38 years of service.

Price-Jordan credits another Navy female leader, Capt. Kate Erb, then Director of the Aviation Maintenance Officer School in Pensacola, Florida, for encouraging Price-Jordan to become a Navy officer.

As a new ensign, Price-Jordan joined Electronic Attack Squadron (VAQ) 129 at Naval Air Station Whidbey Island, Washington, where she served as the detachment maintenance officer aboard USS John C. Stennis (CVN 74). In 2005, while serving as assistant maintenance officer in Patrol Squadron (VP) 46, she received the Capt. Winifred Quick Collins Award for inspirational leadership.

"After 35 years of service, I believe our Sailors—active and

U.S. Navy photo

Cmdr. Deserine Price-Jordan, Fixed-Wing/Operational Support Aircraft deputy program manager, will become the first black female full time support Aerospace Maintenance Duty Officer to be promoted to the rank of captain.

reserve, and the civilians who enable them are the true source of our naval power," she said. "Respect should be both given and earned. If you work hard and take care of your people, treating them with positivity and dignity regardless of race, gender or nationality, you will be rewarded."

Price-Jordan has seen many of the people she trained achieve great success, but one of the most rewarding so far, she said, was inspiring her nephew, Tyreke Price, to enlist in the Navy. Boatswain's Mate Tyreke Price now serves aboard USS Gridley (DDG 101).

In her current position, she is responsible for supervising the cradle-to-grave sustainment of eight different variants of operational support aircraft. She said she will put those multitasking skills to use next summer, as she relieves Capt. Jon Voightlander as Commanding Officer, Naval Air Systems Command (NAVAIR) headquarters and NAVAIR Reserve program director.

"I've had the honor of working closely with Deserine for many years and she is one of the hardest working and dedicated officers you'll ever find," Voightlander said. "I couldn't be more excited about her selection, knowing she'll undoubtedly make many lasting positive impacts. It's a proud moment for the Navy."

Price-Jordan offers the following words of wisdom for the next generation of female leaders in the Navy: "Believe in yourself, surround yourself with friends that will hold you accountable and do not be deterred from your goals."

Valerie Doster is a communications specialist supporting the Tactical Airlift Program Office.

Twin Sisters Share Same Mission Aboard Bush

By PO3 Bryan Valek

The crew aboard aircraft carrier USS George H.W. Bush (CVN 77) prepares to launch an F/A-18 Super Hornet off its deck during a recent flight deck certification. The weapons safety officer inside the aircraft is Lt. Monica Shifflet, from Strike Fighter Squadron (VFA) 103.

The ship's reactor plants deliver the steam required to launch the jet. One of the reactor officers on watch, Lt. Natalie Shifflet, closely monitors the steam build-up in one of the plants below deck.

When the catapult goes off launching the aircraft, Natalie's plant just provided the power for Monica's aircraft to become airborne.

The Shifflet twins, one assigned to Reactor Department aboard Bush and one assigned to VFA-103 "Jolly Rogers," a part of Carrier Air Wing (CVW) 7, are working together to get the ship and the airwing ready for deployment.

"I suppose it all started when I was searching for colleges," Natalie said. While applying to the U.S. Naval Academy, Natalie learned about the Reserve Officer Training Corps (ROTC) program. She and her sister both applied to the program and were accepted into the ROTC program at the Massachusetts Institute of Technology (MIT).

Photo courtesy of Lt. Natalie Shifflet

Then-Lt. j.g. Natalie Shifflet, left, a reactor officer assigned to USS George H.W. Bush (CVN 77), and then-Lt. j.g. Monica Shifflet, a weapons officer assigned to Strike Fighter Squadron (VFA) 103, pose for a photograph together.

While attending MIT, Natalie majored in nuclear science and engineering, and Monica majored in materials science and engineering.

"Four years later, we were both graduating and commissioning in the U.S. Navy," Monica said.

After their commissioning, the twins had very different paths ahead of them. Natalie was assigned to Arleigh Burke-class guided-missile destroyer USS Gonzalez (DDG 66) for two years. Then, after completing her first sea tour, she went to Nuclear Power School and Nuclear Prototype in Goose Creek, South Carolina. Natalie was assigned to CVN-77 upon completion of the nuclear pipeline.

"I can't believe I've only been here a year and seen how far the ship and crew have come since being in the yards," Natalie said.

While Natalie was here for CVN-77's Docking Planned Incremental Availability Period and helped get the ship out of Norfolk Naval Shipyard, Monica was training to become a naval aviator.

After graduating and commissioning, Monica reported to Pensacola, Florida, for flight training. After earning her wings of gold, she reported to a Naval Air Station Oceana-based fleet replacement squadron (FRS), the last stop in the naval flight officer training pipeline. After completing FRS, Monica was detailed to her first squadron.

"When I found out what squadron I was going to, I texted my sister and was like, 'Hey! I got VFA-103," Monica said.

"I was on duty, I had just gotten off watch and went to eat dinner in the wardroom when I saw her text," Natalie said. "I just told a of couple people from my department 'Guess what? My sister is coming to the ship,' to which they instantly started cheering. That made me smile."

As part of Team JACKPOT (CVN-77 and CVW-7), the twins started working toward the same mission: one supporting it from the sky, and one supporting from the belly of the ship.

"Growing up with a twin was nice because you already had someone there, someone who shares the same hobbies and interests," Monica said. "Little did we know we'd be sharing the same mission serving side-by-side in the U.S. Navy."

Petty Officer 3rd Class Bryan Valek is with USS George H.W. Bush (CVN 77) Public Affairs.

New PR 'C' Schools to Improve Aircrew Safety

PR "A" School students unpack the NB-8 Parachute while learning how to inspect a basic parachute in a performance lab.

U.S. Navy photos by Lt. Robyn Ellis

Platform-Specific Flight Gear Training Aims to Improve Performance

By Rob Perry

As part of the ongoing effort to address physiological events (PEs), the focus has turned to flight gear and proper fit, with the aim to ensure crew performance and welfare.

In the past year, the Navy's Root Cause Corrective Action (RCCA) team completed research that focused on identifying potential indicators of equipment issues that could be factors in PEs. A PE involves an actual or suspected aircraft malfunction or an actual or suspected aircrew system malfunction that causes aircrew to experience adverse physiological symptoms, such as headaches, cognitive impairment or a "tingling" sensation in the extremities.

During its analysis, the RCCA teams found that poorly fitted flight gear, including Aviation Life Support Systems (ALSS), was a contributory factor to PEs across all tactical aircraft platforms. Additionally, the analysis noted that Sailors in the Aircrew Survival Equipmentman rating—more commonly referred to as Parachute Riggers or PRs—and Marines in the Flight Equipment (or FE) Military Occupational Specialty (MOS), unlike other ratings, do not have a PR C-School (or subsequent Naval Enlistment Classification) to improve their skills working with platform specific types of ALSS.

Upon learning of this deficiency, the Sailor 2025 Ready Relevant Learning (RRL) initiative saw the need to develop four new PR "C" Schools.

Cmdr. Adrian Jope, Physiological Episode Action Team (PEAT) lead, said the creation of the four new PR C schools was yet another step in addressing the Navy's concerns with PEs.

"What we expected to find when we set out on this journey three-plus years ago was not exactly what we discovered—we found a whole lot more," Jope said. "Everyone wanted a smoking gun when we began investigating the cause of PEs. Many thought that there was something wrong with the aircraft, and we focused a lot of attention there, but as we opened up the aperture, we started to look at the flight gear as well as the human. What we discovered was that PEs have a lot to do with the human and our understanding of our physiology in a pretty high-stress environment."

Jope said flight gear in its design can be constricting and if it isn't fit or worn correctly can further degrade the crew's performance in the aircraft.

Parachute Rigger's Role

PRs are responsible for the maintenance and proper working condition of the flight gear ensemble: the G suit, torso harness and survival vest, which also includes the regulator and mask, as well as parachutes, life rafts and other aviation survival gear.

Bill Goforth, a retired Navy PR Master Chief currently leading the Naval Aviation Survival Training Program (NASTP) service contracts for Aviation Survival Training Centers (ASTCs) at the Naval Air Warfare Center Training Systems Division, detailed the duties assigned to PRs. At aircraft squadrons, they fit, build and maintain aircrew flight gear. At intermediate maintenance facilities, they inspect, repair and repack parachutes for emergency personnel and drogue parachute systems, as well as life preservers and life rafts. PRs perform test check and repair of oxygen components (O_2 regulators, converters, concentrators and hoses). Additionally, some PRs work in a supporting role at special operations units performing inspections and repacking of parachutes used for the Premeditated Personnel Parachuting (P3) Jump Program. They also rig cargo for parachute drops and supervise parachute training evolutions. PRs can also be assigned as water survival instructors at ASTCs.

"The PR holds a position essential to the aviator, aircrew and the Special Forces military services," Goforth said. "PRs are responsible for maintaining emergency escape, personal and cargo parachutes for use in naval aircraft and in the field. In essence, PRs make successful aircraft ejections/egress, aerial operations and deliveries around the world possible."

Birth of 'The Last to Let You Down'

The Parachute Rigger School (Class A) was established at Lakehurst, New Jersey, in 1924. The work of the PR had increased to such an extent by 1942 that the Bureau of Naval Personnel established the Parachute Rigger rating. When founded, the PR rating consisted only of the general service rating with career progression from PR "A" School graduate through PRC. For safety reasons, service members are not allowed to "strike" for PR and must attend the appropriate technical schools to be designated in this rating. On Nov. 14, 1951, the mission of the Parachute Riggers School, authored by John R. Scheib, read: "To inculcate in the trainees a solemn realization as to the grave responsibilities that are entrusted to them.

PR "A" School students rig and pack the SKU-10/A Seat Survival Kit for an NACES SJU-17 (series) Ejection Seat that installs in the F/A-18 Hornet series aircraft.

A PR "A" School instructor, sitting, shows a student proper zipper installation on a sewing project.

Upon their unfailing vigilance to details depends the very lives of naval flying personnel." As of today, the mission and training stand the same, Goforth said.

The original title of the rating was Parachute Rigger. The rating title was changed to its present PR designation in December 1965. The reason for changing the title from PR to Aircrew Survival Equipmentman was to provide a more realistic description of the types of duties performed by PRs. However, Aircrew Survival Equipmentman maintained their official abbreviated title of "PR" after the 1965 name change.

U.S. Navy photos by Lt. Robyn Ellis

PR "A" School Training Officer, PRCM Betsy Green, left, explains to students why it is important to find all discrepancies on flight gear and correct them.

A PR Oxygen Technician student learns the basics for testing an O_2 regulator on the Portable Oxygen Regulator Test Set in a performance lab.

Sailors in the PR rate and Marines in the Flight Equipment MOS are detail-oriented and precise in their work and their motto is "The Last to Let You Down."

Becoming a PR Now and in the Future

Goforth said after basic training, a Sailor must complete PR "A" School, located at Naval Air Technical Training Center at Pensacola, Florida, which includes basic aviation maintenance practices and basic skills required for the rating. Moving forward, Goforth said that in applying the RRL modernization, Sailors will complete the basic PR "A" School, and then be required to attend a platform-specific PR "C" School.

Goforth said that in the course of the RCCA investigation, it was discovered that PRs were learning while on the job how to take care of ALSS specific to the aircraft they supported. Further, if a PR transitioned from one aircraft type to another, for example from rotary-wing to fixed-wing aircraft equipped with ejection seats, there was no follow-on training available to help them learn the new ALSS. To fix this training shortfall, the PEAT is working with RRL teams to correct that deficit through the establishment of a PR "C" School.

"Aviation Life Support Systems have evolved over the years. The modern high-performance aircraft the Navy uses make extreme demands of emergency escape systems/devices," Goforth said. "With more advanced ALSS, the more technical the training becomes."

As a result of the Sailor 2025 initiative, work is underway to deliver a set of modern PR courses that align training with fleet requirements. A workshop conducted with fleet PR subject matter experts identified 104 training gaps. Based on an analysis of those gaps the Navy determined that four new PR C-school courses were required, all of which are currently in the process of being approved. Once the analysis phase is over, the next steps will be to move into the design and development phases of the four new courses.

The plan is that all Sailors and Marines will attend a modernized PR "A" School and then take one of the more specific new "C" School courses depending on what command they will be reporting to: ALSS Technician (Initial) Intermediate Maintenance; Fixed-Wing (Ejection) ALSS Technician (Initial) Organizational Maintenance (O-level); Fixed-Wing (Non-Ejection) ALSS Technician (Initial) Organizational Maintenance; and Rotary-Wing ALSS Technician (Initial) Organizational Maintenance.

By completing the respective courses, PRs will be armed with a thorough understanding of specific aircraft ALSS items and be able to perform appropriate maintenance and inspections as well as ensure aircrew always have the best ALSS fit.

"The new O-level C schools will be focused on fitting the flight gear to pilots and building it up. This will address the improperly fit flight gear issues discovered by the PEAT," Goforth said.

Goforth said the aim is to stand up the new schools within a year, but a firm launch date has not been confirmed.

Nearing the Finish Line

Jope said that with the creation of a C school for PRs, the Navy has taken an even greater step in addressing the causes of and reducing the number of PEs in aircrew.

"We are definitely on track. We have seen a remarkable decline in PEs across all platforms, specifically in the F/A-18 Hornets and T-45 Goshawks [96 percent in F/A-18 and 95 percent in T-45 since their respective 2017 peak rates], which is where a lot of our initial focus was," Jope said.

"It's been a holistic approach, addressing the aircraft and the equipment, but also the human inside of the aircraft. A lot of our focus has been on education—education on the systems and gear that protect our aircrew when they are inside the aircraft and how the ensemble interacts with the aircraft. As it turns out, overall aircrew knowledge was fairly weak in this area and as a result of our collective efforts we have been able to change that. We're very confident that we did not leave any stone unturned," he said.

"Ultimately when the RCCA process concluded in early 2020, we had a combined list of 466 recommended action items across the aircraft, human, flight gear, aerospace medicine, etc. After nearly a year and a half of closing these recommended actions, we are already 73 percent complete and expect to be about 95 percent complete by this time next year."

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

A PR "A" School student packs the LPU-36/P, Low Profile Flotation Collar Life Preserver in a performance lab.

Celebrating the CENTENNIAL

1922 2022

OF THE U.S. NAVY AIRCRAFT CARRIER

During 2022, Naval Aviation celebrates the centennial of the U.S. Navy aircraft carrier.

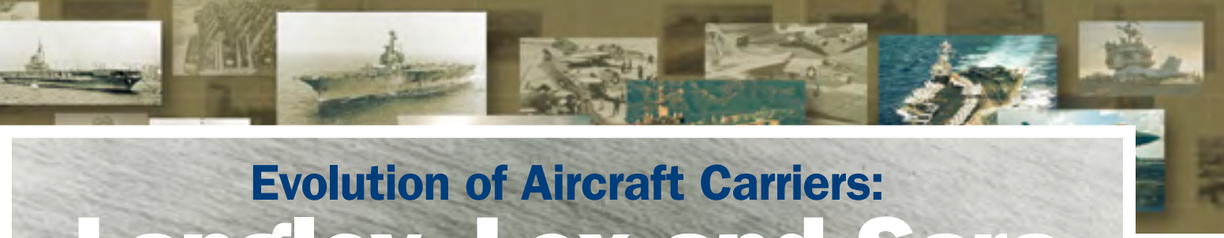
In March, a gala in Norfolk, Virginia, highlights the commissioning of the Navy's first aircraft carrier, USS Langley (CV 1), 100 years ago. Originally constructed as a collier ship, USS Jupiter, was converted into an aircraft carrier beginning in 1920. She would serve from 1925-1936, primarily as a testing platform for the Navy to develop tactics, techniques and procedures for the landing of aircraft aboard ships. She was later converted to a seaplane tender during World War II.

According to former Naval Aviation News staff writer Scot MacDonald, "Small and gangling as she was, USS Langley was the first-born of a large fighting family of powerful Navy ships." In this issue, the NAN revisits MacDonald's 14-article series on the "Evolution of the Aircraft Carrier," first published in 1962-1963.

We hope you enjoy this look back on Naval Aviation's legacy of innovation that began with the Langley to create a history of dominance that continues with the Nimitz- and Gerald R. Ford-class carriers.

Compiled by Andrea Watters, Naval Aviation News editor, and Fred Flerlage, NAN Art Director.

U.S. Navy photo illustration by Fred Flerlage; photographic imagery by U.S. Navy; archived images courtesy of Naval History and Heritage Command (NHHC)



Evolution of Aircraft Carriers:

Langley, Lex and Sara

By Scot MacDonald

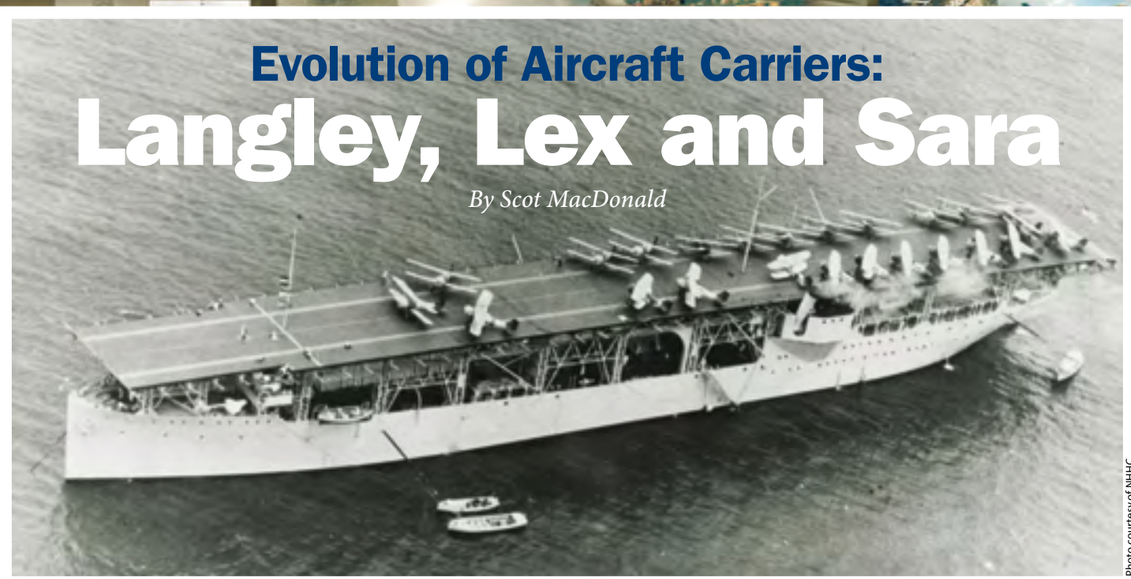


Photo courtesy of NHHC

VE-7s of Fighting Squadron (VF) 6 aboard USS Langley (CV 1) circa 1927.

Editor's note: The following is a condensed reprint of the article from the May 1962 issue of Naval Aviation News.

"One day," said Capt. Thomas T. Craven, who had relieved Capt. Noble E. Irwin as Director of Naval Aviation in May 1919, "one day, when someone suggested that shoveling coal was becoming unpopular, we proceeded to angle for the colliers Jupiter and Jason. Although some conservative seniors frowned on the plan, in time and with the Secretary of the Navy's [SECNAV] approval, we persuaded Congressional committees of the wisdom of converting one ship, [USS] Jupiter, into an aircraft carrier. Having an entirely inadequate speed, the vessel could not possibly fulfill all service requirements, but she could serve as a laboratory for determining naval needs. Naval Aviation took heart."

At the end of World War I, Great Britain had the Hermes, Eagle and Argus in operation, while Germany successfully converted the merchantman Stuttgart into a carrier. Craven was in France at the time, assigned as aide for aviation to Commander, U.S. Naval Forces and Commander, Naval Aviation Forces. He was approached by the CNO—and later, by SECNAV Josephus Daniels—and asked to assume the Office of Director of Naval Aviation.

Returning to America, he immediately studied the problems of strengthening the Navy's complement of pilots and support personnel, obtaining "apparatus suitable for their use," and developing tactics.

Cmdr. Kenneth Whiting, in a memorandum to the Committee on Naval Affairs, sized up the situation: "When the sear ended those who had chosen the Navy as a life work, and especially those of the Navy who had taken up Naval Aviation, revived the question of 'carriers' and 'fleet aviation.' They found the sledding not quite so hard as formerly, but the going was still a bit rough.

"The naval officers who had not actually seen Naval Aviation working retained their ultra-conservatism; some of those who had seen it working were still conservative, but not ultra; they were in the class 'from Missouri' and wished to be 'shown.' Others, among the ranking officers who had seen, had conquered their conservatism, and were convinced.

"This latter group, headed by the General Board of the Navy, and including Adm. Henry T. Mayo, Adm. N.C. Twining, Capt. Ernest J. King and Capt. W.S. Pye, both on the staff of the commander in chief during the war, Capt. H.I. Cone and Capt. Thomas T. Craven, demanded that 'carriers' be added to our fleets.

"The net result of these demands was the recommendation that the collier Jupiter be converted into a carrier in order that the claims of the naval aviators might be given a demonstration."

Jupiter did not possess all the characteristics that would have made her an ideal aircraft carrier, but she

Photos courtesy of NHHC

Capt. Thomas T. Craven, Director of Naval Aviation, pressed hard in Congressional hearings for the conversion of the collier Jupiter.

Rear Adm. William A. Moffett was the first Chief of Bureau of Aeronautics in 1921 and was an ardent advocate of the development of carriers.

did have many advantages. Commissioned April 7, 1913, as fleet collier No. 3, she, with the Neptune, carried the first Naval Aviation detachments to France in World War I. At war's end, she was scheduled for retirement.

"At the time she was selected [for conversion to an aircraft carrier]," Whiting pointed out, "her advantages outweighed her disadvantages."

The ship was slow and might prove a drogue to a fast-moving fleet. But she did have the necessary length to permit planes to fly off from a specially prepared deck. Her hold spaces were very large, "with high head room in them, a difficult thing to find in any ship. She had larger hatches leading to these holds than most ships, a factor permitting the stowing of the largest number of planes."

Jupiter was electrically driven. Her top speed was a comparatively slow 14 knots. One of the clinching arguments for her conversion was her small crew requirement. With hostilities over, non-regular Navy men were eager to continue civilian activities and were leaving service in large numbers.

Jupiter sailed to Norfolk Navy Yard where the conversion work was accomplished. "We thought she could be converted cheaply," Whiting said, "—that was a mistake, however. In any event, she will have cost less when completely converted than any other ship we might have selected. We thought she could be converted quickly—that was another mistake. The war is over, and labor, contractors and material men are taking a breathing spell.

"The recommendation for her conversion was made by the General Board of the Navy early in 1919; Congress appropriated the money [on 11 July] 1919; she was promised for January 1921; she may be ready by July 1921." She was not.

Jupiter's designation was changed to CV on July 11, 1919; she went into the yard for conversion March

USS Langley (CV 1) in Pearl Harbor with 34 planes on her flight deck, May 1928.

U.S. Aircraft Carrier Classes

Langley-class: one ship, USS Langley (CV 1) converted from collier USS Jupiter and used as an experimental ship; served from 1925-36 as an aircraft carrier then converted to a seaplane tender before WWII.
Length: 542 feet **Crew:** 460+ **Aircraft:** 30+

Lexington-class: two ships; USS Lexington (CV 2) and USS Saratoga (CV 3) began construction as battlecruisers before being converted to carriers during construction; Lexington sunk during WWII and Saratoga served until 1946. **Length:** 888 feet **Crew:** 2,700+ **Aircraft:** 80+

Ranger-class: one ship, USS Ranger (CV 4) was the first ship built specifically as an aircraft carrier from the keel up; served from 1934-1946.
Length: 769 **Crew:** 2,100+ **Aircraft:** 80+

A VE-7 aircraft, using a tailhook, lands on USS Langley in May 1927, using longitudinal wires on fiddle bridges for an arresting arrangement.

Douglas torpedo bomber, DT-2, launches from the Langley's deck while carrier is berthed.

Langley's Shipboard Routine

A copy of an order dated Feb. 1, 1923, signed by Langley's executive officer Cmdr. Kenneth Whiting, gives insight into to USS Langley's shipboard routine as the ship prepares to get underway near Norfolk:

"The weather permitting, the ship will get underway at 9:00 a.m. tomorrow, Feb. 2, 1923, and will proceed out of the harbor for the purpose of flying planes off and on the ship.

"The tug Alleghany will accompany the ship and take station 100 yards out and 200 yards astern of the starboard quarter, steaming at same ratio of speed as the Langley—about 6 knots.

"When [pilots are] flying off and on, both lifeboats will be lowered to rail and manned; the first or second motor sailing launch, depending upon which stack is in use will be lowered to the level of the poop deck, manned and equipped with grapnels, crash kits and six men in addition to the crew. The boatswain will be in charge of this boat and will go in the boat.

"The flight surgeon will fly over the ship in a flying boat piloted by O.M. Darling, ACR, USN. This plane will maintain station 200 yards behind and 200 feet above the plane which is flying off and on.

"This seaplane will start from the Naval Air Station upon a radio signal from the ship: Boatswain Fehrer will go in the tug accompanied by three men from the Fourth Division and a crash kit.

"In case of fog tomorrow the ship will not get underway but will stand by until noon; in the event that the fog is cleared up by that time, will proceed.

"Steam will be kept on three boilers and engines in maneuvering condition. In case plane goes into the water, the first boat to get to it shall at once attempt to rescue the aviator, at the same time making a line fast to some strong part of the plane, in order to hold the cockpit above water. This line, if possible, should be passed around one of the 'A' frames or engine section, or a longeron in the vicinity of the cockpit."

Photos courtesy of NHHC

USS Lexington (CV 2) anchored off Honolulu, Hawaii, Feb. 2, 1933.

Flight personnel handling torpedoes, prior to World War II onboard Lexington.

A Vought O2U-2 Corsair, assigned to Scouting Squadron (VS) 3B, taking off from USS Lexington (CV 2) in February 1929.

A Loening OL seaplane flies over USS Lexington (CV 2).

1920 and was commissioned USS Langley (CV 1) on March 20, 1922, at Norfolk.

In the yards, all the coal-handling gear was removed from the collier and a flight deck, 534 feet long and 64 feet wide, was installed. At first, it was planned that this deck would be completely free of obstruction, and so it was in the Langley.

An elevator was installed to lift planes from the assembly and storage deck to the flight deck. A palisade was built around this elevator to provide a windbreak, protecting the planes and men while the aircraft were being assembled.

For the hoisting of seaplanes, two cranes with large outreach were installed on the hangar deck, one on either side of the ship. Traveling cranes were installed beneath the flight deck for hoisting planes from the hold and for transferring them fore and aft to the ship spaces and elevator.

The collier's firerooms were located well aft. This permitted an easier handling of gasses to guarantee a minimum interference with planes when they touched down on her deck. She had ample space for machine, carpenter, metal and wing repair stowage; spare parts, spare engines, and shops; for gasoline and lubricating oil and aircraft ammunition. Her living quarters appeared to be a bit crowded, but sufficient for the work to be undertaken.

From May 1919 to March 1921, Craven directed much attention to the training of pilots. "Pending the completion of facilities that would enable the Navy to train pilots to fly landplanes from the deck of a carrier," he wrote, "arrangements were effected to have naval flyers instructed in the Army school at Arcadia, Florida. The entire naval contingent[s] quickly and easily completed the Army's course." They also received Army training at Mitchel Field on Long Island and at Langley Field, Virginia.

Earlier, Lt. Cmdr. Godfrey de Courcelles Chevalier led a team of 15 pilots who were put into training with landplanes, practicing touch-and-go flight deck landings on a 100-foot-long platform constructed on a coal barge at the Washington Navy Yard. The barge was moved to Anacostia where landing tests were conducted.

Experiments were conducted at Hampton Roads, Virginia, in which Lt. Alfred M. Pride participated. A turntable platform was used, similar to the type the British developed in WWI—in turn, an improvement of Ely's arrangement used on the Pennsylvania. A Bureau of Aeronautics (BUAER) letter dated Nov. 19, 1923, described the Langley and British systems. The Langley gear, the letter states, "depends on an athwartship retarding force while the [British] gear depends on air resistance together with the resistance set up by fore and aft cables." The Langley wires were suspended about 10 inches above the deck. They were not entirely

U.S. Aircraft Carrier Classes

Yorktown-class: three ships; served from 1937-1947 with two ships lost in WWII.
Length: 809 feet **Crew:** 2,900+ **Aircraft:** 70+

Wasp-class: one ship, built as a modified Yorktown-class with 3,000 fewer tons to use up allotted tonnage under the Washington Naval Treaty; served from 1940-1942.
Length: 741 feet **Crew:** 2,300+ **Aircraft:** 80+

Essex-class: 24 vessels, which came in short-hull and long-hull versions; served from 1942-1991 as backbone of Navy's combat strength during World War II.
Length: 872 **Crew:** 3,400+ **Aircraft:** 90+

Independence-class: nine ships built in this light-carrier class and converted from cruiser hulls while under construction; served 1942-1956.
Length: 622 feet **Crew:** 1,300+ **Aircraft:** 30+

Midway-class: three ships; one of the longest-lived carrier designs; first-in class USS Midway (CV 41) served from served from 1945-1992, decommissioned after Gulf War. **Length:** 972 **Crew:** 4,000+ **Aircraft:** 100+

Forrestal-class: four ships; first class of "supercarriers;" served from 1955-1998.
Length: 1,036 feet **Crew:** 4,000+ **Aircraft:** 75+

satisfactory, but were used, with some modifications, in the Lexington and Saratoga until 1929.

When Langley eventually went to sea in September 1922, she had an arresting gear installed.

"It is the Navy's mission to protect our coasts, our seaborne commerce, and far-flung possessions. Once war is forced upon us we must take the offensive to win it. The Navy is the first line of offense, and Naval Aviation as an advance guard of this line must deliver the brunt of the attack. Naval Aviation cannot take the offensive from shore; it must go to sea on the back of the fleet."

—Rear Adm. William A. Moffett, USN, October 1925

The first take-off from the deck of Langley was piloted Oct. 17, 1922, by Lt. Virgil C. Griffin in a VE-7-SF. On Oct. 6, the first landing was made by Chevalier in an Aeromarine aircraft while the ship was underway. He had contributed significantly to perfecting the arresting gear installed aboard—still in an experimental stage. His plane nosed over. Whiting, on Nov. 18, became the first to catapult from the deck of Langley; he flew a PT torpedo bomber.

These aircraft—and other types used at the time—were of standard design. BUAER decided to delay introducing new types, although studies of planes built for carrier operations started with the conversion of the collier. Vought and Aeromarine service types were first to be modified for operations aboard; arresting hooks were installed, and the landing gear strengthened.

For the first three years following her commissioning, USS Langley had no regularly assigned squadrons. She was used as an experimental ship, testing gear and aircraft, and training pilots and support personnel. For the first five years of her operations, she was the only aircraft carrier in the U.S. Navy. Because of the flight deck installed, she was quickly dubbed "the Covered Wagon," and this was reflected in her official insignia.

The principle purpose of Langley was to teach naval aviators about carrier operations, but the early days were certainly tough on pilots, according to "Our Flying Navy," a book published in 1944.

"'Instrument face' was the distinguishing mark of Langley's pilots, who loosened teeth and flattened noses against their instrument panels while negotiating the hazards of landing on Langley's small flight deck and crude arresting gear. Planes went overboard, piled up in the crash barrier, stood on their noses and came apart. [There were few fatalities.] But the science of carrier operations was developed as a monument to these pilots' perseverance." The "small flight deck" was as long as later-day "baby flattops."

Arresting gear and catapult systems were tried, modified, improved upon; pilots qualified for carrier landings and take-offs. In March 1925, Langley entered her first fleet exercise, Fleet Problem No. 5, off the lower coast of California. Scouting flights from the carrier now became standard procedure and so impressed official observers that they recommended the completion of USS Saratoga and USS Lexington be speeded up.

There was an urgency related to these tests. Already in the ways were the keels of two battle cruisers destined for the scrap heap as a result of the Washington Naval Treaty of 1922. A clause within this treaty permitted their conversion to aircraft carriers. Tests aboard Langley were to influence greatly the final designs of the two ships under conversion. These converted battle cruisers were to become USS Lexington (CV 2) and USS Saratoga (CV 3).

Before Langley was commissioned, Craven became Commandant of the Ninth Naval District, and was relieved March 7, 1921, by Capt. William A. Moffett, who became the last Director of Naval Aviation. On July 26, 1921, that office was abolished, replaced by the newly authorized Chief of the Bureau of Aeronautics, which Moffett assumed.

For the full article and series, visit **https://www.history.navy.mil/content/history/nhhc/research/histories/naval-aviation-history/evolution-aircraft-carriers.html**

Photos courtesy of NHHC

USS Saratoga (CV 3) at anchor sometime in the 1930s.

USS Saratoga flight deck circa fall 1941 with Grumman F4F-3 aircraft in the foreground and Douglas SBD-3 Dauntless and TBD-1 Devastator aircraft parked further back.

USS Saratoga (CV 3) launching planes, circa summer 1941, as seen from the rear cockpit of a plane that has just taken off.

U.S. Aircraft Carrier Classes

Kitty Hawk-class: three ships; similar to Forrestal-class plus missile launch capability; served from 1961-2009.
Length: 1,069 feet **Crew:** 4,500+ **Aircraft:** 75+

Enterprise-class: one ship; first nuclear-powered carrier; modified Kitty Hawk-class design. Six ships planned, only one constructed; commissioned in 1961, deactivated in 2012 and decommissioned in 2017, serving longer than any combatant ship in American history.
Length: 1,101 feet **Crew:** 5,300 **Aircraft:** 90+

Kennedy-class: one ship; last conventionally powered aircraft carrier; sometimes grouped as a Kitty Hawk-class ship.
Length: 1,047 feet **Crew:** 4,900+ **Aircraft:** 75+

Nimitz-class: 10 ships; last Nimitz-class carrier, USS George H.W. Bush (CVN 77), commissioned in 2009.
Length: 1,092 feet **Crew:** 5,600+ **Aircraft:** 60+

Ford-class: first-in-class USS Gerald R. Ford (CVN 78) launched in 2017 and expected to deploy in 2022. The Navy originally planned to build 10.
Length: 1,092 feet **Crew:** 4,200+ **Aircraft:** 75+

Sources: *"Dictionary of American Naval Fighting Ships" Naval History and Heritage Command and "U.S. Aircraft Carriers: An Illustrated Design History" by Norman Friedman.*

U.S. Navy Nuclear Aircraft Carriers

From Navy Fact File

Aircraft carriers are the centerpiece of America's naval forces—the most adaptable and survivable airfields in the world. On any given day, Sailors aboard an aircraft carrier and its air wing come to the fight trained and equipped across a full range of missions. They are ready to control the sea, conduct strikes and maneuver across the electromagnetic spectrum and cyberspace. No other naval force fields a commensurate range and depth of combat capabilities.

Aircraft carrier USS Gerald R. Ford (CVN 78) transits the Atlantic Ocean while conducting carrier qualifications in May 2020.

U.S. Navy photo by MC2 Ruben Reed

Aircraft carriers continue to be the centerpiece of power projection and forward military presence. In times of crisis, the first question leaders ask is: "Where are the carriers?"

Often the presence of an aircraft carrier has deterred potential adversaries from striking against U.S. interests. Aircraft carriers support and operate aircraft with crews trained and equipped to engage airborne, afloat and ashore targets that threaten freedom of the seas; and to deliver sustained power projection operations in support of U.S. and coalition forces.

The aircraft carrier and its strike group also engage in maritime security operations to interdict threats to merchant shipping and to check adversaries seeking to use waterways for terrorism and piracy. Carrier strike groups also provide unique capabilities for disaster response and humanitarian assistance. The embarked carrier air wing fields helicopters for direct support as well as command, control, communications, computers and intelligence assets to support operations and to ensure aid is routed quickly and safely.

Today's Carriers

The Nimitz- and Gerald R. Ford-class aircraft carriers are the largest warships in the world, each designed for an approximate 50-year service life.

USS Nimitz (CVN 68), USS Dwight D. Eisenhower (CVN 69), USS Carl Vinson (CVN 70), USS Theodore Roosevelt (CVN 71) and USS Abraham Lincoln (CVN 72) have completed their refueling complex overhauls (RCOH) at Newport News, Virginia, with USS George Washington (CVN 73) and USS John C. Stennis (CVN 74) currently in RCOH.

The lead ship of the next generation of aircraft carrier, USS Gerald R. Ford (CVN 78) was delivered in 2017 as the force structure replacement for USS Enterprise (CVN 65), which was inactivated in 2012.

U.S. Navy photo by MC2 Markus Castaneda

Aircraft carrier USS Nimitz (CVN 68) leads a formation of ships from the Nimitz and Theodore Roosevelt Carrier Strike Groups during dual-carrier operations in February 2021.

Gerald R. Ford-class

The Gerald R. Ford-class is the next-generation successor to the Nimitz-class aircraft carriers. The lead ship, USS Gerald R. Ford (CVN 78), was commissioned in 2017. The Ford-class will be the premier forward asset for crisis response and early decisive striking power in a major combat operation, providing core capabilities of forward presence, deterrence, sea control, power projection, maritime security and humanitarian assistance. In addition to delivering enhanced warfighting capability, the Ford-class also brings quality of life improvements for our Sailors and reduced total ownership costs.

"Carrier Strike Groups built around nuclear-powered aircraft carriers (CVNs) are the preeminent arbiter of world peace and stability, designed to deliver lethal, agile and resilient power sought by our presidents and combatant commanders. World maritime powers know the proven value of CVNs and their embarked aircraft and aspire to develop comparable capabilities of their own. When global order is threatened, security is upheld by an agile fleet of aircraft carriers to deter our adversaries and defend our national interests."

—Vice Adm. Kenneth R. Whitesell, Commander, Naval Air Forces

Gerald R. Ford concluded an 18-month Post Delivery Test and Trials (PDT&T) period and Combat Systems Ship's Qualification Trials in mid-April 2021 with the crew logging an exceptional performance. During PDT&T, the ship completed all required testing, accomplished work ahead of plan, improved system reliability for new technologies, and served as the East Coast platform for conducting pilot carrier qualifications for more than 400 newly qualified and re-qualifying pilots.

Gerald R. Ford proved it was capable of operating in contested environments by successfully completing Full Ship Shock Trials in the Atlantic Ocean, with the third and final explosive event conducted on Aug. 8, 2021.

Since delivery, Ford has logged more than 8,100 launches/arrestments using the Electromagnetic Aircraft Launching System (EMALS) and Advanced Arresting Gear (AAG). The ship is now completing its inaugural Planned Incremental Availability and will be available for fleet tasking in late 2022.

The Ford-class is designed to maximize the striking power of the embarked carrier air wing with systems and configuration optimized to enhance the sortie generation rate (SGR) of embarked strike aircraft, resulting in a significant increase in SGR over the Nimitz-class. Ford is the first aircraft carrier designed with all electric utilities, eliminating steam service lines from the ship, reducing maintenance requirements and improving corrosion control. The ship's configuration and electrical generating plant can accommodate a host of new systems, including directed energy weapons.

The Ford-class is also designed to operate effectively with almost 600 fewer crew members than a Nimitz-class ship. New technologies and ship design features reduce watch standing and maintenance workload for the crew—EMALS, AAG and Dual-band Radar all offer enhanced capability with reduced manning.

The lessons learned while introducing Ford's technological advancements will be carried forward to the next carriers of the class: John F. Kennedy (CVN 79), Enterprise (CVN 80) and Doris Miller (CVN 81).

The legacy of carrier innovation, first ignited with the commissioning of USS Langley (CV 1) in 1922 and fueled through the years with the introduction of jet aircraft, angled decks and nuclear power, has kept the aircraft carrier fleet relevant and integral to national defense. In today's era of great power competition, the Ford-class continues the aircraft carrier's trajectory of adaptability that will enable these new ships to serve our nation for decades to come.

U.S. Navy photo by MCS Isaac Esposito

CVN-78, foreground, and Nimitz-class aircraft carrier USS Harry S. Truman (CVN 75) transit the Atlantic Ocean in June 2020, marking the first time a Nimitz- and Ford-class aircraft carrier have operated together underway.

General Characteristics, Nimitz-class

Builder: Huntington Ingalls Industries Newport News Shipbuilding Co., Newport News, Virginia
Commissioned: May 3, 1975 (USS Nimitz)
Unit Cost: About $8.5 billion in constant year fiscal 2012 dollars
Propulsion: Two nuclear reactors, four shafts
Length: 1,092 feet (332.85 meters)
Beam: 134 feet (40.84 meters); Flight Deck Width: 252 feet (76.8 meters)
Displacement: Approximately 97,000 tons (87,996.9 metric tons) full load
Speed: 30+ knots (34.5+ miles per hour)
Crew: Ship's Company: 3,000-3,200, air wing: 1,500, other: 500
Armament: Multiple NATO Sea Sparrow, Phalanx CIWS and Rolling Airframe Missile (RAM) mounts
Aircraft: Approximately 60+
Ships in Class
USS Nimitz (CVN 68), Bremerton, Washington
USS Dwight D. Eisenhower (CVN 69), Norfolk, Virginia
USS Carl Vinson (CVN 70), San Diego, California
USS Theodore Roosevelt (CVN 71), Bremerton, Washington
USS Abraham Lincoln (CVN 72), San Diego, California
USS George Washington (CVN 73), Newport News, Virginia
USS John C. Stennis (CVN 74), Newport News, Virginia
USS Harry S Truman (CVN 75), Norfolk, Virginia
USS Ronald Reagan (CVN 76), Yokosuka, Japan
USS George H.W. Bush (CVN 77), Norfolk, Virginia

General Characteristics, Gerald R. Ford-class

Builder: Huntington Ingalls Industries Newport News Shipbuilding Co., Newport News, Virginia
Commissioned: July 22, 2017 (USS Gerald R. Ford)
Propulsion: Two nuclear reactors, four shafts
Length: 1,092 feet
Beam: 134 feet; Flight Deck Width: 256 feet
Displacement: approximately 100,000 tons full load
Speed: 30+ knots (34.5+ miles per hour)
Crew: 4,539 (ship, air wing and staff)
Armament: Evolved Sea Sparrow Missile, Rolling Airframe Missile, CIWS
Aircraft: 75+
Ships in Class
USS Gerald R. Ford (CVN 78), Norfolk, Virginia
PCU John F. Kennedy (CVN 79)
PCU Enterprise (CVN 80)
PCU Doris Miller (CVN 81)

COVID SUCCESS STORIES

UAV MICROTRANSPONDER DEVELOPMENT MOVES FORWARD DURING COVID

From the Naval Air Traffic Management Systems Program Office

The ongoing COVID-19 global pandemic has presented challenges across DoD and Microtransponder Development was no exception. Through 2020 and 2021, the project incurred several challenges, which were overcome to keep the project on an aggressive development schedule.

The Microtransponder project is a Small Business Innovation Research effort started in 2014 to develop the next-generation transponder to accommodate Group 2 and Group 3 Unmanned Aircraft Systems (UAS). These smaller UAS, also known as unmanned aerial vehicles or "drones," require transponders of reduced size, weight and power compared to currently available transponders. Current military transponders are too heavy and bulky to accommodate these smaller platforms.

Drones are used at an increasing rate and secure identification is needed now to reduce risk when operating within the same battlespace as other military systems. Until now, positive ID of these aircraft has not been possible.

With the Microtransponder Development team spread across the country, they relied heavily on email and regular teleconferences to keep everyone on the same page. COVID had a big impact on the number of people that could gather for test events and design reviews—events that would normally bring the entire team together in one room.

Navy and Army sponsors supported all biweekly meetings and were available—sometimes daily—for direction, support and professional guidance with the developer.

Additionally, base access for out-of-state residents was heavily restricted at various times. To adjust, test events were reduced to only required personnel and the program relied on its partners at Georgia Tech Research Institute and support contractor JF Taylor for facilities.

The project team did not change how they worked, just increased the frequency of meetings. Early in the pandemic there were issues with overloaded teleconference services. The team relies heavily on presentations, action lists and teleconferences now as well as before the pandemic to stay on track. When outages occurred, the team moved quickly to a back-up platform or rescheduled meetings.

Major milestones accomplished included completion of the Critical Design Review, AIMS Box certification, and platform system integration.

Flexible scheduling of test assets and manpower by the Navy team at Naval Air Station Patuxent River, Maryland, and Naval Air Weapons Station China Lake, California, along with personnel from Naval Air Warfare Center Aircraft Division Webster Outlying Field, were crucial to supporting integration activities.

The integration is all but complete and the first flight test is planned for this year.

The project team will continue to use many of the practices that got them through the pandemic. Design and management reviews will continue for stakeholders to attend remotely and attendance at test events will be kept to a minimum.

"The ability of multiple contractors and program offices to consistently work together to overcome roadblocks and keep project progress and schedule moving forward has been instrumental in the successes of the Microtransponder project," said Michael G. Fisher, Microtransponder Project Lead for the Naval Air Warfare Center Transponder and Interrogator Engineering Branch.

U.S. Navy photo

An example of a Microtransponder that will be installed aboard Group 2 and Group 3 Unmanned Aircraft Systems.

U.S. Navy photo by Petty Officer 3rd Class Christopher K. Hwang

Sailors assigned to Strike Fighter Squadron (VFA) 81 load an AIM-9X Sidewinder air-to-air missile onto an F/A-18E Super Hornet aboard aircraft carrier USS Carl Vinson (CVN 70).

AIR-TO-AIR MISSILES PROGRAM HITS MILESTONES AMID COVID-19 PANDEMIC

By Katie Ursitti

Despite the challenges of the COVID-19 pandemic, the Air-to-Air Missiles Program Office was able to hit milestones, from delivering new production missiles to international partners, to making arrangements for timely depot repairs, and accepting delivery of its 10,000th AIM-9X Sidewinder missile on behalf of the U.S. Air Force on May 27.

The program office's International Programs Team supports and manages 109 active foreign military sales (FMS) cases, valued at $3 billion, on behalf of 36 countries and organizations. FMS is a large part of the program's success and is crucial to the U.S. Navy's mission as it fosters strong international partnerships, protects the U.S. warfighter and creates economies of scale savings for the program office's most prominent missile in its portfolio—the Air Intercept Missile (AIM)-9X Sidewinder.

As the world shut down in response to the pandemic, the program acted swiftly when all pre-planned face-to-face continental U.S. and overseas engagements with partner countries were cancelled. Immediate flexibility was key in adjusting from in-person engagements to virtual engagements.

Strategically planning virtual meetings around multiple schedules and time-zones was challenging, but the team was quick to ensure all customers were well-supported during this period.

"I am undoubtedly proud of the entire program for being able to quickly adapt to challenges that none of us could have anticipated over the last 18 months. The team's willingness to embrace change and the teamwork they have all demonstrated has been the foundation of our success over this unprecedented time," said Capt. Errol Campbell, program manager.

Issues ranging from poor connectivity, operator error, lack of proper virtual equipment and difficulty understanding speakers due to language barriers, threatened mission success. As these challenges emerged, addressing the needs of FMS customers seemed almost impossible. Virtual engagements forced the team to adjust schedules to accommodate three time zones at a time. For example, during one meeting, representatives from Maryland, Arizona and Australia were simultaneously conducting a virtual AIM-9X Program Review. Ultimately, the professionalism and dedication of the team led to mission success.

Virtual engagements are beneficial in that they save money and time. However, in-person meetings are more effective when it comes to creating and maintaining relationships with the program's international partners. In fact, face-to-face meetings are so important, that the team is resuming approved travel outside of the continental U.S. to support AIM-9X international partners, such as Poland and Japan.

Katie Ursitti supports Air-to-Air Missiles Program Office Communications.

H-60 Program Achieves Readiness Goals

NSS-A Initiatives Lower Costs

From the H-60 Multi-Mission Helicopters Program Office

The H-60 Multi-Mission Helicopters Program Office recently met its mission-capable goal entirely within its own organic lifelines. The accomplishment was achieved through the program office's organic implementation of Naval Sustainment System-Aviation (NSS-A), its Readiness Control Board (RCB) process and a laser-focused commitment to its fleet counterparts.

An MH-60R Seahawk, attached to the "Saberhawks" of Helicopter Maritime Strike Squadron (HSM) 77, takes off from the flight deck of guided-missile cruiser USS Shiloh (CG 67).

U.S. Navy Photo by MC1 Rawad Madanat

The program's readiness efforts, reliance on data-driven decision making and collaboration with fleet and industry partners have all led to a downward trend in Naval Supply Systems Command's long-standing Seahawk Performance-Based Logistics (PBL) Aviation Depot Level Repairable costs—the cost of repairable aircraft parts—over the last five years.

"The H-60 team sustains many strong working relationships between government and industry partners. This group continually delivers and takes pride in ownership of each H-60 that they maintain, operate or deploy," said Capt. Todd Evans, H-60 program manager. "It is no surprise their initiatives resulted in meeting our mission-capable goals."

The leadership team leveraged the current organic work force and skillsets from within the program office and the Fleet Support Team (FST) to align available skills and resources from various partners that closely match those required to contribute and implement NSS-A pillars efficiently.

NSS-A is a modernized sustainment ecosystem designed to achieve and maintain naval aircraft readiness goals by leveraging best commercial practices across communities to drive improvement in maintenance, supply and governance activities. Seven pillars work together to form the foundation of NSS-A. Their combined efforts reach across siloed activities to create a holistic approach to maintaining naval aircraft readiness goals. The pillars are the Maintenance Operation Center/Aircraft-on-Ground Cell; Operational-level Reform; Fleet Readiness Center Reform; Supply Chain Reform; Engineering and Maintenance Reform; Governance, Accountability and Organization; and Cost.

The team leverages the data collected through its NSS-A efforts in its RCB process, in which the program office's Readiness Cell subject matter experts rigorously analyze degraders to generate maintenance practice improvements, reliability improvements, cost reductions, maintenance man-hour reductions root cause and corrective actions. The team has conducted 29 RCBs with a total of 50 degraders briefed resulting in 186 projects. The team has completed 131 of those projects and currently has 55 open projects—all geared to attacking degraders. Every RCB project has an end-state to monitor or further actions that improve fleet capabilities, boost safety or save the program and fleet resources.

U.S. Navy photos by MC3 Richard Cho

Aviation Electronics Technician 2nd class Logan Fields supervises personnel during post-maintenance function checks of a Seahawk, assigned to HSC-23, aboard LCS-1.

Aviation Machinist Mate (AD) 3rd class Daniella Miranda conducts maintenance on an MH-60S Seahawk helicopter, assigned to the "Blackjacks" of Helicopter Sea Combat Squadron (HSC) 21, aboard Independence-variant littoral combat ship USS Tulsa (LCS 16).

The program office focuses on understanding what the fleet needs to maintain readiness and make smart maintenance decisions for their aircraft. This focus has led to initiatives like the Integrated Electronic Technical Manuals conversion for the cadre of H-60 maintainers. The program recently converted its maintenance plans from the older MIL-STD-1388 format to the new S1000D format—one of only a few program offices to accom-

U.S. Navy photos by MC3 Richard Cho

AD 2nd class Colton Zac performs maintenance on the tail rotor of a Seahawk, assigned to the "Wildcards" of HSC-23, aboard USS Freedom (LCS 1).

Aviation Structural Mechanic 3rd class Hermanjeet Singh conducts maintenance on an MH-60S, assigned to HSC-21, aboard LCS-6.

plish the conversion. The S1000D format update facilitates more efficient communication with industry partners and provides the most up-to-date maintenance instructions. The entire conversion process was conducted through an organic workforce at the program's FST at Marine Corps Air Station Cherry Point, North Carolina.

Further accuracy and enhancements were made as a result of coordinating and reviewing 39 MH-60 maintenance plans—three more than the goal of 36, or one-third in accordance with Naval Air Systems Command policy. This allows greater accuracy of 36 aircraft and three Peculiar Support Equipment Maintenance Plans relating to logistics support analysis data, updates to technical publications and provisioning data for the MH-60 fleet. This coordination involved the review and incorporation of more than 1,800 comments into 39 maintenance plans across every Integrated Product Team.

Alongside all the readiness efforts and process improvements, the program leads the fleet in efficient, targeted maintenance with its Depot Integrated Maintenance Program. The team works with its fleet counterparts to integrate maintenance tasks while aircraft undergo maintenance in its Planned Maintenance Interval (PMI) integrating organizational maintenance into depot maintenance events. The team worked with the fleet to update the community's PMI operating support periods to enable 36 months of true operating time for aircraft on the flight line. These directions extended aircraft on flight lines while reducing the annual number of PMI events from 150 to around 128 providing cost savings of about $22 million a year throughout the Naval Aviation Enterprise.

Stakeholder Collaboration

The program office puts a premium on collaboration with the major stakeholders in the H-60 community. The fleet and program work together on their Aircraft Utilization Plan which ensures the community has adequate aircraft on the flight line and buying back aircraft that require a baseline. The coordination helps the community maintain its readiness goals and ensures Sailors have operational and safe aircraft to carry out their assigned missions. Additionally, the program works alongside its industry partners in PBL product and process improvement efforts on a monthly basis. This process, which is similar to RCBs, ensures the program maximizes benefits for PBL to drive reliability improvements and cost reductions.

"We understand that we must build relationships and trust among all stakeholders within H-60 community," said Troy Seifert, MH-60 product support manager. "Stronger relationships and trust equate to shared ownerships and teamwork toward understanding and achieving common goals in direct support to our fleet."

FRCE Verifies Laser Peening Process

U.S. Navy photo

Fleet Readiness Center East transportation specialists move the first F-35B Lightning II aircraft to undergo laser peening modifications into the laser peening facility in early 2021.

By Heather Wilburn

Fleet Readiness Center East (FRCE) marked a milestone in its support of the F-35B Lightning II aircraft when it successfully completed verification of the laser shock peening (LSP) process and returned the first aircraft to undergo the procedure to the fleet.

Laser shock peening strengthens the aircraft's frame without adding any additional material or weight. The procedure helps extend the life expectancy of the fifth-generation F-35B fighter, which is the short takeoff-vertical landing (STOVL) variant flown by the Marine Corps.

Verification provides quality control by confirming the process meets system-level requirements through a combination of inspection, analysis, demonstration and testing. FRCE is the first and only facility in the world capable of conducting the LSP modification on an F-35 aircraft.

"The laser shock peening modification is essential to extending the life of the F-35B STOVL variant, and the ability to complete this procedure successfully allows FRC East to support this critical workload," said FRCE Commanding Officer Col. Thomas A. Atkinson. "Standing up this strategic capability positions FRC East as a readiness multiplier for the future of Marine Corps Aviation, and I'm proud of the hard work and dedication shown by the team in achieving verification of the process and returning the first laser shock peened F-35 aircraft to the fleet."

FRCE completed construction on a $6 million, purpose-built laser shock peening facility in August 2019 and inducted the first F-35 in June 2020.

Achieving the verification milestone required a cooperative effort by a multidisciplinary team that spans FRCE, the F-35 Joint Program Office (JPO), the aircraft manufacturer and the contractors that developed and conduct the laser peening procedure.

"The big picture here is that we set up a capability that has never been stood up before," said Jeanie Holder, the F-35 JPO induction manager at FRCE. "This is going to be a major part of the FRC East F-35 workload for the next five to seven years," she said.

Ike Rettenmair, the interim Fixed Wing Division director at FRCE, acknowledged that the teamwork between stakeholders helped make the effort successful. "We have a great partnership between the working entities, and that makes all the difference," he said.

Process Improvement

Almost 15,000 labor hours went into verifying the laser peeing process.

"Our team got in there and completed the modification according to the engineering instruction, found any issues or trouble spots and documented these areas," said Wes Klor, overhaul and repair supervisor on the F-35 modification line at FRCE.

"The artisans will take the instructions and work them, step-by-step, until they get to a point where they see an area for correction or improvement," he said. "Then they work with Engineering to make changes to the engineering instruction on the spot and test out these solutions. Finally, they repeat the entire process successfully."

"Verification makes the process repeatable," he said. "You could take that instruction now and go complete this modification anywhere in the world, if you had an LSP facility, because all the steps are correct and in the right order. You have everything you need to do it."

As the first facility with this capability, FRCE is sharing their expertise with a second LSP facility at Ogden Air Logistics Complex at Hill Air Force Base, Utah, which is scheduled to come online in the near future. The Air Force facility has even sent members of its workforce to observe and learn from the work done at FRCE, Rettenmair said.

The skill and enthusiasm of the artisans on FRCE's F-35 modification line make this type of success possible at the depot and beyond, he said.

Heather Wilburn is public affairs specialist with Fleet Readiness Center East.

U.S. Navy photos

Josh Arthur (left), Fleet Readiness Center East sheet metal work leader, and Paul Spicer, air frames work leader, replace anchor nuts holding panels in place on an AV-8B Harrier at Marine Corps Air Station Cherry Point.

Raiheem Tillman, FRCE integrated electronics systems mechanic, tapes wire harnesses as part of maintenance on an AV-8B Harrier.

FRCE Returns Final Harrier to Cherry Point Squadron

By Kimberly Koonce

The AV-8B Harrier program at Fleet Readiness Center East (FRCE) reached a milestone on the aircraft's journey into the sunset as the line delivered the final aircraft it will service for one of the last Marine Corps Harrier squadrons.

In September, Marine Attack Squadron (VMA) 542 at Marine Corps Air Station (MCAS) Cherry Point, North Carolina, took possession of the newly refurbished AV-8B Harrier, which had been in for Planned Maintenance Interval (PMI) inspection and Integrated Maintenance Program (IMP) assembly at FRCE since December 2020. FRCE has performed 45 of these events for the squadron since PMI's inception in 2003; however, VMA-542 is slated to become Cherry Point's first F-35 Lightning II squadron and, as a result, has no more depot maintenance scheduled for its AV-8B Harriers.

Many of the production line's maintainers have spent their careers associated with the Harrier program at FRCE. They say it is bittersweet to watch as the aircraft is replaced by the more advanced technology of the F-35.

"You've got a lot of blood, sweat and tears invested in the airplane, but you also understand that it's time to move on," said Ike Rettenmair, FRCE Fixed Wing Division director, whose Harrier experience dates back to his Marine Corps service. "There's better technology out there with the F-35. It's time, but it's still kind of sad to see."

Before the PMI-D inspection, the squadron disassembles the aircraft and turns it over to FRCE. Aviation maintenance professionals inspect the aircraft and repair the discrepancies they find, which accounts for about 5,300 hours of work, according to Rettenmair.

After the PMI-D phase is complete, the aircraft enters the IMP assembly phase, during which FRCE artisans reassemble the aircraft, ground check it and release it to the squadron for the aircraft's functional check flight. FRCE is scheduled to continue performing PMI-D inspections for the Marine Corps' two remaining AV-8B squadrons through 2028.

For its final aircraft for VMA-542, the AV-8B line went the extra mile to impress the squadron. IMP assembly averages 127 days, but the squadron's deployment date was quickly approaching. The line shaved 12 days from the assembly phase to deliver the aircraft in 115 days—just six days before the Marine Expeditionary Unit's planned workup date.

"Everyone knew we had to meet the turnaround time for the fleet, trying to make the boat, and it gave the team a 'we can do this' mentality," said Jeff Broughton, AV-8 planner and estimator at FRCE. "The whole team chipped in their full support to meet the squadron's needs."

"All of us know how valuable it is for the Marines to get the asset back," Rettenmair said. "When they have a product coming right out of the depot to go on deployment, that's less headache for the squadron, fewer worries, fewer issues with the airplane."

The line's physical proximity to MCAS Cherry Point's Harrier squadrons has cemented FRCE's already close relationship with the Marines it serves. The squadrons and maintainers are colocated in the same office spaces, which makes face-to-face communication a daily occurrence.

"The quality of the work and the level of detail, especially when I sit in on their meetings and hear the teams interact, have been outstanding," said Maj. Robert Lien, Marine Aircraft Group-14 aircraft maintenance officer. "Their goal is to beat the timeline without sacrificing quality. It's really good to see that not just their minds but their hearts are into the machine. It's awesome to see how they care about the Marines on the flight line."

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

FRCNW Enhances Organic Manufacturing Capabilities

By Teri Heisler and Lt. j.g. Tai Dozier

Fleet Readiness Center Northwest (FRCNW) is integrating and promoting additive manufacturing (AM) in its defense industrial facilities to increase materiel readiness and enhance warfighter capabilities.

As part of the DoD AM strategy, FRCNW was the first to receive the Tier 2 AM 3D Industrial Polymer printer for use in printing Naval Aviation parts and equipment. Installation, training and implementation of the printer took place in October.

Tier 2 AM printers are suitable for non-critical and select critical Naval Aviation applications. These printers have larger volumes, rapid print speeds, climate-controlled printing envelopes, post processing and reverse engineering capabilities, computer-aided design workstations and specialized software to enable capability development.

U.S. Navy photo

Personnel at FRCNW receive training on a Naval Aviation Additive Manufacturing Tier 2 3D printer. FRCNW is the first DoD site selected to receive the Tier 2 AM 3D Industrial Polymer printer for use in printing Naval Aviation parts and equipment.

"Team FRCNW is extremely excited to serve as the fleet's lead deployment site for the Tier 2 AM systems that provide the capability to print aviation related parts on-demand at the point of need," said FRCNW's Commanding Officer, Cmdr. Mike Windom.

The Tier 2 AM printer has a variety of manufacturing applications including early and functional prototyping, end-use parts, production tooling and jigs with 16 materials ranging from engineering-grade thermoplastics to high-performance polymers.

"Through approval processes and specifications defined by Naval Air Systems Command's (NAVAIR) AM Team we can manufacture these parts utilizing our Tier 2 AM printer and we now have the ability to come up with suitable part replacements that are more cost effective," said Petty Officer First Class Nicholas Duggins, leading petty officer for the AM program at FRCNW.

This rapid, iterative approach to capability development will reduce costs, technological obsolescence and acquisition risk. It enables the rapid production of prototypes, leading to decreased development times and faster iterations.

"We will be producing Naval Aviation parts and equipment, consumable fixtures, maintenance fixtures and parts that cannot be acquired anymore or have very long lead times. Upon receipt of the Tier 2 system and understanding its capabilities, we immediately identified two candidate AM parts that have caused frequent maintenance challenges and submitted them to NAVAIR for review; one is a panel on an F/A-18 and the other is a maintenance fixture to be used by intermediate-level depots for P-3's," said Jesse Weber, FRCNW civilian supervisor.

The plan for Naval Aviation AM is that it is distributed, scaled and networked across multiple machines and locations. This versatility contributes to a reduced risk of obsolete parts and can mitigate diminishing manufacturing sources and material shortages.

DoD will continue to collaborate and bring together stakeholders from across the armed services, defense industry and academia to reduce barriers to the adoption of AM and integrate it into the supply chain.

"As a 34-year maintenance professional, I have great expectations that this will be unlike any capability I have had at a command. It's an honor to blaze this trail for fellow DoD and Department of Navy entities and provide the pilot data needed to give industry, NAVAIR and the DoD a better understanding of current capabilities and a clear vision of what they can be," Windom said.

Teri Heisler was the acting public affairs officer for Commander, Fleet Readiness Centers and Lt. j.g. Tai Doz is the Fleet Readiness Center Northwest Maintenance Control Officer.

U.S. Navy photo by Charles Arnold

An MV-22B Osprey scheduled for delivery to Marine Medium Tiltrotor Squadron (VMM) 362 is pictured at the test line Dec. 1 with some of the program's artisans from left: Von Charlie Villaro, Melson Santiago, Jonathan Hernandez, Abner Ventura, Danil Rybakov and Ramon Lopez.

FRCSW Improves Its MV-22B Readiness by 50 Percent

By Jim Markle

Two years ago, Fleet Readiness Center Southwest (FRCSW) inducted its first MV-22B Osprey for a Planned Maintenance Interval-2 (PMI-2) event. Since then, the command's approach to PMI-2 servicing of the tiltrotor aircraft has evolved to a readiness level perhaps unseen in the maintenance any other airframe.

PMI-2, along with PMI-1, comprise the Navy's Integrated Maintenance Program (IMP) that was developed to maintain the aircraft and its structural integrity.

"Our first four [PMI-2] inductions averaged 555 days and our last two deliveries had an average of 240 days," said Michael Dixon, V-22 production manager.

"The workload standard for the PMI-2 cycle time is 482 days; however, under the Naval Sustainment System (NSS), leadership has determined 250 days to be an appropriate cycle time," he said.

The NSS is a 2018 Secretary of the Navy initiative designed to increase production and speed.

Dixon attributed the program's production line with meeting—and exceeding—the NSS directive.

"Our production line works diligently to highlight product constraints and delivers short and long-term resolutions to ensure production goals are achieved," he said.

As the line becomes more established, he said, the PMI-2 turnaround time (TAT) correspondingly trends lower.

Some of the key factors that improved TAT included the production line gaining more experience with maintenance procedures; the hiring of aircraft examiners who have organizational-level experience; the qualification of two aircraft examiners to ground turn the aircraft; and implementing major changes to the PMI phases including rearranging phase requirements.

The command's V-22 production line is staffed by 30 artisans including mechanics, electricians, sheet metal mechanics and aircraft examiners. The line is supported by a variety of administrative positions that include production control, quality assurance, logs and records and leadership roles.

Marine Corps squadrons fly the Ospreys to the command's test line for PMI-2 where the aircraft undergo the induction process prior to towing to the building where the maintenance cycle is performed.

"PMI requirements consist of disassembling the aircraft to evaluate the structural and wiring inspection requirements per the V-22 PMI specification," Dixon said.

"We repair or correct any discrepancies that are noted. Then reassemble, test and troubleshoot the aircraft to ensure all systems that have been disturbed are functional and flight ready; all of which is easier said than done, as extensive maintenance is involved within this process."

When complete, the aircraft are returned to the test line for ground turn operations and a function flight check (FCF) prior to delivery.

FRCSW delivered five MV-22s last year to its customers assigned to Marine Air Group (MAG) 16 at Marine Corps Air Station (MCAS) Miramar, California, and MAG-39 aboard Marine Corps Base Camp Pendleton, California.

The command is scheduled to induct three MV-22s for PMI-2 in fiscal year 2022 and three during fiscal year 2023.

If all goes well during its FCF, the most recent Osprey inducted in May is projected for delivery to Marine Medium Tiltrotor Squadron (VMM) 362 at MCAS Miramar in less than 227 days, three weeks under the NSS designated cycle time.

Jim Markle is a public affairs specialist at Fleet Readiness Center Southwest.

FRCSW Delivers E-2D Ahead of Schedule

By Jim Markle

FRCSW is the Navy's sole provider of E-2D PMI-2 events, and on Dec. 1, the command delivered its first E-2D to complete PMI-2 under the new 220-day turnaround time (TAT).

The E-2D Advanced Hawkeye Airborne Early Warning System, the fourth variant manufactured by Northrop Grumman that was brought into service in 2010.

FRCSW performs two levels of periodic maintenance on the airframe: a light planned maintenance interval-one (PMI-1) and PMI-2, a heavy maintenance. The procedures are performed under a 96-month cycle: PMI-1 completed every 48 months, and PMI-2 48 months later.

The maintenance event was completed five days early, and the aircraft was returned to Air Test and Evaluation Squadron (VX) 20 based at Naval Air Station Patuxent River, Maryland.

"Technically, this was the first of four aircraft for fiscal year 2022. However, we completed eight in fiscal 2021, as well," said John Goolsby, E-2/C-2 Integrated Product Team (IPT) lead.

The E-2Ds are completely disassembled during PMI-2. Artisans evaluate, repair and perform a complete wiring analysis of the aircraft. The aircraft's corrosion preventive paint is also removed and an in-depth metal assessment targets cracks, corrosion, exfoliation and other surface anomalies. The aircraft are painted afterward.

"Once an aircraft is through with PMI repairs, a month-long functional check out is performed at the test line to include a functional check flight," Goolsby said.

To ensure the best possible TAT for the E-2D, Goolsby said that the program initiated a few measures that were applied to the VX-20 aircraft.

"The E-2 program completely overhauled production flow and kitting to establish start and completion times for every part on the aircraft. We have a production tool very similar to a Buffer Management Tool that turns a part yellow if it's within three days past due, and turns it red if it's past three days due. Therefore, every part is tracked within three days of execution. This provided managers with a tool to manage the daily execution of the aircraft within three days of schedule," he said.

"We also cleared out aged work-in-progress, and for the VX-20 aircraft, landing gear was provided and not repaired under the shadow of the aircraft," he said.

To further ensure the 220-day TAT is achieved, Goolsby said that the program is currently working to have the fleet purchase landing gear for the aircraft.

"The PMI line can and will execute to a 220-schedule if aircraft are level loaded and material is provided. The Fleet Support Team, MRO-E and Components—the rotodome and landing gear shops—were instrumental in our achieving the 220-day TAT. If they didn't execute, we would not have achieved the goal. They are an integral part of the team," he said.

"I am very proud of my E2/C2 team. They have embraced the Naval Sustainment System principles and aggressively pursued our benchmark goals to turn the first post-NSS E-2D out in 215 days. The collaboration between FRCSW and our partners is what made this possible," said FRCSW Commanding Officer Capt. Steve Leehe.

Jim Markle is a public affairs specialist at Fleet Readiness Center Southwest.

U.S. Navy photo by Christopher Nette

The first E-2D Advanced Hawkeye to complete PMI-2 prepares for its return to Airborne Command & Control Squadron (VAW) 120 from the FRCSW test line January 2020.

Professional Reading

By Cmdr. Peter Mersky, USNR (Ret.)

Pacific Profiles, Volume Four, Allied Fighters: Vought F4U Corsair Series, Solomons Theatre 1943-1944 Pacific Profiles, Volume Five, Japanese Navy Zero Fighters (land-based) New Guinea and the Solomons

By Michael John Claringbould, Avonmore Books, Kent Town, South Australia, 2021, 120 pp., Ill. (Vol. 4) and 112 pp., Ill (Vol.5).

During World War II, certain pairings developed between opposing aircraft. To name two, in the Battle of Britain in 1940 were the Spitfire and the Bf-109, and in the Pacific, the F4U Corsair and the Mitsubishi Zero. While the big, gull-winged Corsair was the new fighter, its main opponent was the Mitsubishi Zero, a veteran that had been in action since before the attack on Pearl Harbor on Dec. 7, 1941.

By 1943, the cauldron of the Solomons in the south Pacific, gradually included a growing cadre of U.S. Marine Corps squadrons bringing in the new F4Us, with their main opponent rapidly becoming the Zero, which remained a highly dangerous adversary when flown by still-competent Japanese naval aviators, those who had not been lost at the Battle of Midway in June 1942.

These two new volumes from Australian researcher and artist Michael Claringbould place the two widely differing fighters in sharp focus with photos and meticulous profiles, as well as equally appealing illustrations to support the fact-filled text that create an encyclopedic look at the area war in the mid-war in the Pacific and the markings of specific aircraft in theater at the time.

U.S. Marine Corps photo

A VMF-214 F4U-1A taxis at Munda in 1943. This Corsair shows the later "bubble" canopy that succeeded the iconic "bird cage" canopy of the earlier F4U-1. Note the three-tone color scheme and the white stripe on the tail, indicating a flight leader.

Photo courtesy of Michael John Claringbould Collection

Two Zeros fly in formation somewhere between Rabaul and Bougainville in late 1943. The Zero in the foreground is an A6M5 variant that would supplant the earlier models and fly to the end of the war. The Zero in the background is an A6M3 model.

U.S. Marine Corps photo

1st Lt. Donald Balch of VMF-221 considers his good luck as he sits by the damaged tail of his F4U-1. He had been involved in a dogfight with a Zero on July 7, 1943. Cannon fire from the Zero damaged his tail section but he was able to return to the Russell Islands where he fish-tailed during landing and blew his port main tire. Balch eventually shot down five Japanese aircraft to become an ace while still flying with VMF-221.

Courtesy of Michael John Claringbould Collection

This unusual photo shows the graveyard of several Japanese aircraft, including Zeros, right after the war. The late-war dark green color led to reports by U.S. crews of "black Zeros." The dark green paint often turned brown because of atmospheric influences.

"Volume 4" deals with the 18 mostly Marine squadrons that flew the Corsair—there was one Navy shore-based squadron, Fighter Squadron (VF) 17—in the roughly two years that included the Solomons campaign. The F4U-1 was easily identified with its characteristic "bird cage" cockpit canopy. A few F4U-1As carried more of a bubble canopy. The Navy took a year to get comfortable with its big blue fighter around a carrier. The Corsair's long nose made the approach and following landing on a carrier's flight deck more difficult for newly-winged aviators. Its companion F6F Hellcat was much more forgiving to less experienced aviators.

"Volume 5" describes the mid-war career of the redoubtable Mitsubishi Zero-sen, technically the A6M type 0 fighter and its shore-based—carrier squadrons are not included—service, largely bases northwest of Guadalcanal and considerable farther, which made the lighter Zero with its longer range, ideal for lengthy sorties against Allied aircraft and bases.

And in a "breaking news" situation, I have just learned of an upcoming publication from Osprey by this same author, "Duel 119," due out in March 2022, highlighting the same comparison of the F4U and Zero, but of course, in a different presentation featuring different graphics and photos. It's an unusual setup I haven't seen in my 40 years of writing this column.

An important point is that the two Avonmore books reviewed here focus more on the color schemes and markings of individual aircraft, while the upcoming Osprey book pays more attention to the details of the fighting that took place.

The Fighting Corsairs, the Men of Marine Fighting Squadron 215 in the Pacific During WWII

By Jeff Dacus, Lyons Press, Guilford, CT. 2021. 295 pp., Ill.

Many books and articles have been written about the Marine Corps F4U Corsair squadrons in the Pacific. There has even been an enduring television series on what qualifies as the most well-known squadron of all—Pappy Boyington's Black Sheep of Marine Attack Squadron (VMF) 214.

This new book concerns one of the rank-and-file units, which had its own cadre of colorful and successful Marine aviators, one of whom is of admittedly personal interest—1st Lt. Robert M. Hanson. He scored 25 kills in the F4U Corsair, the most of any aviator, and also called my hometown of Newton, Massachusetts, his own as well. Over the years, I have tried to confirm this fact, even trying to find Hanson's street address, without success. I thought I knew this suburb of Boston pretty well, having spent most of my pre-adult life there from 1952 to 1971, and graduated from Newton High School in the sub-section of Newtonville, which is actually given as Hanson's home of record.

Be that as it may, there's no denying VMF-215's colorful story and thus, retired Marine Master Sgt. Dacus' deeply researched account is welcome, with some technical and stylistic reservations. His somewhat rough writing style eventually smooths out by the middle of the book.

The photos are poorly printed within the text, allowing many details on aircraft to be somewhat obscured, and the few maps supplied from other sources are small and sometimes difficult to read. As many maps are from Marine publications, they may have presented

Photo courtesy of Michael John Claringbould Collection

The VMF-215 flight line at Torokina Field on Bougainville.

Photo courtesy of Michael John Claringbould Collection

VMF-215 CO Maj. Bob Owens after landing at Munda in August 1943. The white tip of the vertical tail indicates a division leader. Note the underwing national insignia, which sports the newly added "bars" that became part of the star-in-a-circle.

Courtesy of National Archives and Records Administration

VMF-215 lines up for an award ceremony. 1st Lt. Robert M. Hanson is fourth from the right. He would eventually become the top-scoring Corsair ace with 25 kills before being killed in action. He would receive a posthumous Medal of Honor.

freedom from copyright concerns, especially in today's growing period of false demands from publishers and other so-called authorities that authors take extra special care in obtaining permission to use these graphics, which appear to be scaring off both writers and potential publishers.

This could have been a much better book if the author had been offered and taken guidance in handling his subject's history and vernacular. He writes about a period in WWII that involved a number of Corsair squadrons in the Pacific that were dealing with an unfortunately high number of pilot losses or injuries that were really not the fault of their big complex fighter, whose early models had rough areas that were soon addressed and cleaned up.

One of the most enjoyable portions is how the author describes the development of the squadron, how the pilots come to know each other and become a fighting unit as they go up against the still-dangerous Japanese Army and Navy squadrons that had taken hold of the Pacific right after Pearl Harbor in early December 1941. We meet the young, inexperienced aviators, as well as the up and coming younger men and go through their experiences as they develop into the men who took the war to the enemy, losing some of their number and their aircraft in doing so.

Their time on leave in Sydney, Australia, is also well described as the Aussies welcome their American comrades. The people from Down Under take the young Americans into their hearts, offering them comfort and solace, renewing their fighting spirit before they return to the front.

Chapter 11 is one of the longest in the book and gives a running description of what it was like to fly and fight a mid-war escort mission against the Japanese Zero, many of whose Imperial Navy pilots remained skilled in using their once-top-line fighters against the Marines' F4Us that were completely counter to their enemy's design philosophies.

As the book heads toward it final chapters, Dacus' descriptions of almost daily multi-plane engagements take on lives of their own. We get into the meat of the book and its purpose, namely to tell a squadron's story and those of the men who manned the unit and its Corsairs at a desperate time.

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BACK TO TOC