Aboard USS Jackson, MQ-8C Fire Scout Returns to Flight

An MQ-8C Fire Scout, attached to the “Wildcards” of Helicopter Sea Combat (HSC) Squadron 23, assigned to the Independence-variant littoral combat ship USS Jackson (LCS 6), prepares to land aboard Jackson, April 19. *U.S. NAVY / Mass Communication Specialist 3rd Class Charles DeParlier*

PHILIPPINE SEA – The Independence-variant littoral combat ship USS Jackson (LCS 6) completed underway return to flight operations of the Navy’s unmanned helicopter, the MQ-8C Fire Scout, in the Philippine Sea on April 20, commander Destroyer Squadron 7 public affairs said April 27.

The flights at sea were a conclusion of MQ-8 operational testing to return to routine flights on littoral combat ships deployed to the Indo-Pacific. The MQ-8C, assigned to the “Wildcards” of Helicopter Sea Combat Squadron (HSC) 23, attached to Jackson, operated simultaneously with the squadron’s MH-60S Seahawk helicopter.

The completion of the return to flight operations will allow the MQ-8C to continue to operate concurrently with other ships and airborne assets as operations require. In recent weeks, the “Blackjacks” of Helicopter Sea Combat Squadron (HSC) 21 also completed return to flight operations for their MQ-8B Fire Scout variants, assigned to USS Tulsa (LCS 16) and USS Charleston (LCS 18) on deployment in the U.S. 7th Fleet area of operations.

“It’s great to be flying the MQ-8C again, especially for an extended period with our MH-60S,” said Lt. Cmdr. Richard Mooney, head of HSC-23 detachment attached to Jackson. “Coordinated manned-unmanned operations like these provide numerous advantages to our surface combatants.”

MQ-8B and C Fire Scout variants are designed for suitably equipped ship-based and land-based autonomous systems. MQ-8B and C Fire Scout combined with MH-60S extend Naval Aviation’s capability to support maritime operations providing integrated, over-the-horizon intelligence, surveillance, reconnaissance and targeting, and combat logistics support.

Fire Scout operations are a whole-ship effort, requiring effective coordination between the aviation and surface entities aboard.

“I am extremely proud of our crew and the HSC-23 detachment for their planning and execution in getting the MQ-8C in the air,” said Cmdr. Brian Bungay, commanding officer of the USS Jackson. “We’re excited to build on this success and continue to increase the LCS’s war-fighting capability.”

Attached to DESRON 7, USS Jackson is on a rotational deployment to the U.S. 7th Fleet area of operations in support of security and stability in the region, and to work alongside allied and partner navies to provide maritime security and stability, key pillars of a free and open Indo-Pacific.

Navy to Adjust F/A-18 Service Life Modernization as Needed to Address Strike Fighter Shortfall

An F/A-18E Super Hornet, assigned to the "Vigilantes" of Strike Fighter Squadron (VFA) 151, launches from the flight deck of the Nimitz-class aircraft carrier USS Abraham Lincoln (CVN 72) on April 13 during a U.S.-Japan bilateral exercise. *U.S. NAVY / Mass Communication Specialist Seaman Apprentice Julia Brockman*

ARLINGTON, Va. – The Navy is planning to use a "rheostat" approach to adjust the F/A-18E/F Super Hornet strike fighter Service Life Modernization (SLM) program to mitigate the strike fighter shortfall in the fleet, a senior service

official said.

The SLM is a sustainment program designed to increase the service life of Block II F/A-18E/Fs. The initial SLM phase extended the service life from 6,000 flight hours to 7,000 flight hours. The program beginning in 2023 will increase the service life to 10,000 flight hours. The line also will be used to upgrade many Block II aircraft to the Block III configuration.

During an April 27 hearing of the House Armed Services Committee's subcommittee on Tactical Air and Land Forces, the chairman, Rep. Donald Norcross (D-New Jersey), said in his opening remarks that "two years ago the strike fighter shortfall would have lasted until 2030. However, last year the Navy told us that the strike fighter shortfall would be resolved to zero in 2025, primarily due to the solid justification for terminating the new F/A-18 Super Hornet line."

Norcross said he was skeptical of this year's analysis of the F-35C production rate and the "lackluster" F/A-18E/F SLM program and the "non-rapid development of the Navy's Next-Generation Air Dominance [program]."

He said the Congress authorized the procurement of 12 F/A-18/E Super Hornets in the 2022 budget as "risk mitigation," aircraft the Navy said that it did not want. The Navy also did not request any Super Hornets in the 2023 budget proposal.

He said the Navy's strike fighter shortfall "will not be resolved until six years later [from 2025] in 2031 because of further unplanned reduction in F-35 purchases, reduced aircraft inductions into the F/A-18 [SLM] program."

Frederick "Jay" Stefany, performing the duties of assistant secretary of the Navy for Research, Development and Acquisition, told the subcommittee that said the SLM program had been "stabilized."

Rear Adm. Andrew Loiselle, director, Air Warfare Division in the Office of the Chief of Naval Operations, said the Navy has drilled down on the issues with the SLM and has begun to turn around the cost of the program.

“In the past year we’ve seen a 30% percent cost reduction in our Phase One 7,500-hour SLM deliveries due to the implementation of best practices with pre-SLM grooming, engineering reutilization and overall touch-flavor learning and efficiencies,” he said.

“We expect continued cost savings as SLM matures and we are executing our planned transition to full-kit, 10,000-hour SLM inductions if fiscal ’23,” Loiselle said. “Full-kit inductions will provide full Block III capability identical to new production aircraft at one third of the cost, giving us 4,000 additional flying hours, or enough to fly for 13 additional years.

“Right now, our SLM plan is our rheostat that we’re using to control availability in the out years, depending on schedules and future budgets that are unknown at this point in time,” he said. “Right now, I do not plan to do SLM on the entirety of my Block II force and I do not plan to do it on my Block I force. If there are changes in the future that require additional capabilities [and] I need more Block III aircraft, then I have the ability to dial up that rheostat on SLM and be able to do that for a longer period of time and to potentially use the FRCs [Fleet Readiness Centers] to increase capacity for SLM beyond the currently planned 35 per year.”

Loiselle said two Block I Super Hornets were put through SLM but based on the results the Navy decided not to proceed with SLM of Block I aircraft “unless there is some requirement to do so in the future.”

Loiselle said the turn-around time of an SLM will be 15 months.

Boeing currently is building Block III Super Hornets to the Navy. At the current production rate, the production is expected to run to the first quarter of fiscal 2026, Loiselle said.

Navy Proposes Divestment of Special Ops Helicopter Squadron

Sailors assigned to the “Firehawks” of Helicopter Sea Combat Squadron 85 (HSC-85) prepare an MH-60S Seahawk helicopter for flight operations aboard Naval Air Station North Island in August 2020. *U.S. NAVY / Mass Communication Specialist 1st Class Chelsea Milburn*

ARLINGTON, Va. — The U.S. Navy is proposing to retire its only

expeditionary helicopter squadron dedicated to support of special operations forces with the service's 2023 budget request.

Helicopter Sea Combat Squadron 85 (HSC-85), a reserve squadron based at Naval Air Station North Island, California, is equipped with MH-60S Seahawk helicopters to support "Naval Special Warfare forces and other special operations forces training and readiness," according to the Department of the Navy's 2023 budget highlights book.

The drawdown of HSC-85 would begin in 2023 with reduction in manpower and flying hour reductions would begin in 2024. Unless the MH-60S aircraft are needed elsewhere in the fleet, the aircraft would be placed in storage. The Navy estimates the program savings would amount to $312.5 million over the Future Years Defense Plan.

HSC-85 originally was established as Helicopter Anti-Submarine Squadron 85 (HS-85) in 1970 at NAS Alameda, California, and equipped with the SH-3A Sea King helicopter, later upgrading to the SH-3D and SH-3H versions. The squadron moved to NAS North Island in 1993 and in October 1994 was redesignated Helicopter Combat Support Squadron 85 (HC-85), shifting to the roles of search and rescue, logistics and range support.

The squadron was redesignated HSC-85 in February 2006 and equipped with MH-60S helicopters. In 2011, special operations support became its primary role, and it was equipped with an older version of the Seahawk, the HH-60H. The Navy planned in 2016 to deactivate HSC-85 and its East Coast counterpart, HSC-84, but HSC-85 survived. The squadron in 2018 upgraded to the Block III version of the MH-60S.

SECDEF Announces Flag Officer Nominations

ARLINGTON, Va. – Secretary of Defense Lloyd J. Austin III announced April 26 that the president has made the following nominations:

Navy Vice Adm. Lisa M. Franchetti for appointment to the grade of admiral, and assignment as vice chief of naval operations, Washington, D.C. Franchetti is currently serving as director for Strategy, Plans and Policy, J5, Joint Staff; and senior member, U.S. Delegation to the United Nations Military Staff, Washington, D.C.

Navy Vice Adm. Stephen T. Koehler for reappointment to the grade of vice admiral, and assignment as director for Strategy, Plans, and Policy, J-5, Joint Staff; and for appointment as senior member of the Military Staff Committee of the United Nations, Washington, D.C. Koehler is currently serving as commander, 3rd Fleet, San Diego.

Navy Rear Adm. Sara A. Joyner for appointment to the grade of vice admiral, and assignment as director, Force Structure, Resources and Assessment, J-8, Joint Staff, Washington, D.C. Joyner is currently serving as chief of legislative affairs, Washington, D.C.

Navy Rear Adm. Craig A. Clapperton for appointment to the grade of vice admiral, and assignment as commander, Fleet Cyber Command; and commander, 10th Fleet, Fort George G. Meade, Maryland. Clapperton is currently serving as commander, Combined Joint Task Force, Cyber, 10th Fleet, Fort George G. Meade, Maryland.

Navy Rear Adm. (Select) Richard J. Cheeseman Jr. for appointment to the grade of vice admiral, and assignment as deputy chief of naval operations for personnel, manpower, and

training, N1, Office of the Chief of Naval Operations; and chief of naval personnel, Washington, D.C. Cheeseman most recently served as commander, Carrier Strike Group 10.

Marine Corps' New VH-92 Presidential Helicopter Achieves Initial Operational Capability

Marine Helicopter Squadron One (HMX-1) runs test flights of the new VH-92A over the south lawn of the White House on Sept. 22, 2018. *U.S. MARINE CORPS / Sgt. Hunter Helis*

ARLINGTON, Va. – The Marine Corps' VH-92A presidential support helicopter has achieved initial operational capability, according to the Department of the Navy.

The VH-92A, built by Lockheed Martin, has been going through

testing and crew training and achieved IOC on Dec. 28, 2021. No announcement by the program office was made at the time. The IOC was announced in the Navy Department's budget highlights book for fiscal 2023 which was published in mid-April.

The VH-92A reaching IOC was confirmed April 26 during a hearing of the Seapower subcommittee of the Senate Armed Services Committee by Frederick Stefany, who is performing the duties of the assistant secretary of the Navy for Research, Development and Acquisition.

"We achieved IOC of the VH-92 – the presidential helicopter – and we are now starting the commissioning process with the White House to get that helicopter into the White House's fleet," Stefany said.

The presidential helicopter fleet is flown by Marine Helicopter Squadron One (HMX-1). Currently HMX-1 flies the VH-3D Sea King and VH-60N Black Hawk helicopters.

The fiscal 2023 budget proposal funds the VH-92A program at $45.6 million and "continues developing product improvements for incremental incorporation to the VH-92A capability baseline to include enhancements to Wide Band Line of Sight [WBLOS] communication capability, cockpit upgrades, government furnished equipment, shipboard interoperability, software upgrades and commences developing product improvements for distributed network communications and vehicle performance enhancements."

The planned fleet of VH-92As will include 21 operational aircraft and two test aircraft. Full operational capability of the VH-92A is planned for the second quarter of fiscal 2023.

Marine Corps Deactivates Two Helo Squadrons, One Temporarily

U.S. Marines with 3D Radio Battalion prepare for transport by CH-53E Super Stallion helicopters assigned to HMH-463 at "LZ Kutree," Hawaii, Dec. 13, 2021. *U.S. MARINE CORPS / Cpl. Dalton J. Payne*

ARLINGTON, Va. — The U.S. Marine Corps has deactivated two helicopter squadrons in its march toward Force Design 2030, but one of the squadrons will be reactivated later this year, the service said.

Marine Heavy Helicopter Squadron 463 (HMH-463) — a CH-53E Super Stallion squadron known as Pegasus — was deactivated on April 21 at Marine Corps Air Station Kaneohe Bay, Hawaii. The unit, which had been based in Hawaii since 1971, had been drawing down over the year and transferring its helicopters to other squadrons.

Marine Light Attack Helicopter Squadron 367 (HMLA-367) — a

unit known as Scarface – had operated AH-1Z Viper and UH-1Y Venom helicopters from Kaneohe Bay since 2012. It was deactivated on April 22, also at Kaneohe Bay.

However, HMLA-367 will be reactivated later this year at Marine Corps Air Station Camp Pendleton, California, where four other HMLA squadrons are stationed with Marine Aircraft Group 39.

The two squadrons are the second and third to be deactivated as part of Force Design 2030, the Marine Corps concept to build a lighter, more agile force able to operate and survive inside an enemy's targeting zone. An MV-22B Osprey squadron, Marine Medium Tiltrotor Squadron 166 (VMM-166), was deactivated late last year.

The Corps still maintains two MV-22B squadrons at Kaneohe Bay – VMM-268 and VMM-363 – with Marine Aircraft Group 24. The service plans to establish a new KC-130J Super Hercules squadron at Kaneohe Bay to support the mobility of Marine forces in the Pacific.

GA-ASI Integrates Leonardo Seaspray V2 Maritime Radar Onto MQ-9 RPA

An MQ-9A Block 5 remotely piloted aircraft equipped with a Leonardo Seaspray 7500E V2 multi-mode radar. *GENERAL ATOMICS AERONAUTICAL SYSTEMS*

SAN DIEGO – General Atomics Aeronautical Systems Inc. has integrated the Leonardo Seaspray 7500E V2 multi-mode radar onto an MQ-9A Block 5 remotely piloted aircraft and performed its first test flight on April 14, the company said April 26. The maritime-focused radar is also being fitted for the MQ-9B SeaGuardian.

“The benefits of this Maritime Patrol Radar in the complex littoral and maritime intelligence, surveillance and reconnaissance environment will add world-class situational awareness for our RPA,” said GA-ASI Vice President of International Strategic Development Robert Schoeffling.

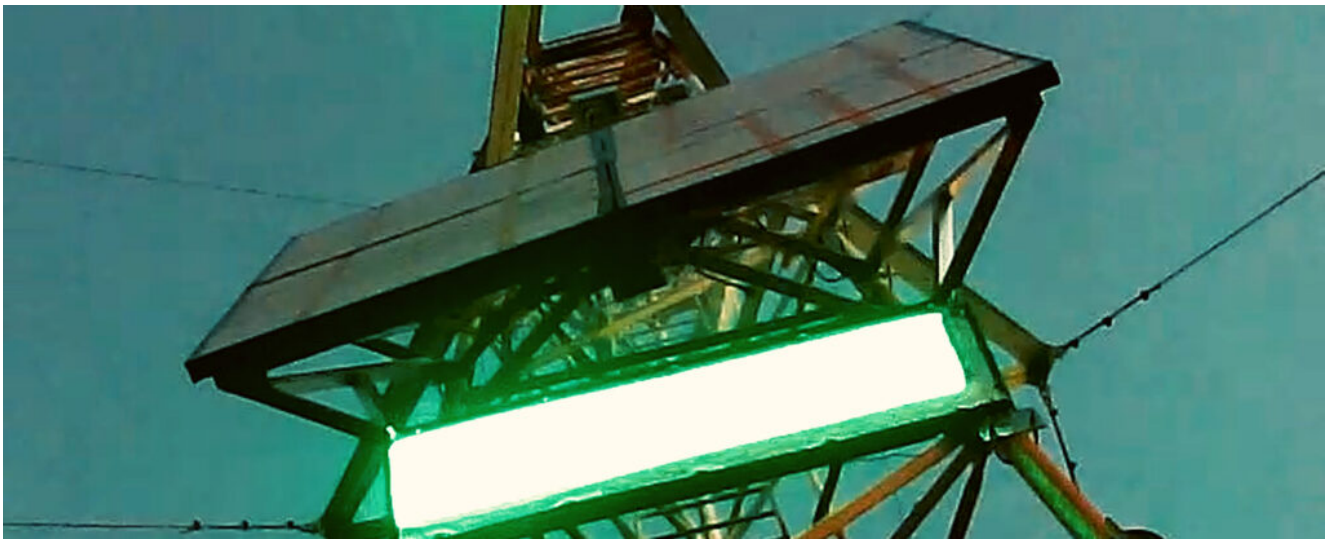
Designed and manufactured in Edinburgh, United Kingdom, the Leonardo 7500E V2 radar is the latest variant of the highly successful Seaspray Active Electronically Scanned Array radar family, featuring updated processor and receiver technology to meet the evolving demands of the ISR mission set. The 7500E V2 is the largest and most capable Seaspray AESA radar and enhances the operationally proven 7500E.

The Seaspray greatly enhances the capabilities of GA-ASI RPA

and builds on the already close working partnership between GA-ASI and Leonardo.

“Seaspray’s long-range, wide-area maritime and ground surveillance capability makes it an ideal fit for the MQ-9A and MQ-9B,” said Tony Innes, vice president of sales, Radar and Advanced Targeting at Leonardo. The V2 offers significant range increases for certain critical modes, improved maritime detection and the ability to handle a high number of targets, while improving on its already-capable over-land mode suite.”

NRL Conducts Successful Terrestrial Microwave Power Beaming Demonstration



A demonstration using the MIT Haystack Ultrawideband Satellite Imaging Radar transmitter for higher average power. *NAVAL RESEARCH LABORATORY*

WASHINGTON – A team of researchers from the U.S. Naval Research Laboratory recently demonstrated the feasibility of terrestrial microwave power beaming by transmitting 1.6

kilowatts of power over 1 kilometer, the most significant power beaming demonstration in nearly 50 years, NRL said April 20.

Microwave power beaming is the efficient, point-to-point transfer of electrical energy across free space by a directive microwave beam. The project, Safe and COntinuous Power bEaming – Microwave (SCOPE-M), was funded by the Office of the Undersecretary of Defense for Research and Engineering's Operational Energy Capability Improvement Fund and led by project principal investigator Christopher Rodenbeck, Head of the Advanced Concepts Group at NRL.

Within 12 months, NRL established the practicality of terrestrial microwave power beaming and beamed 1 kilowatt of electrical power over a distance of 1 kilometer using a 10 gigahertz microwave beam. SCOPE-M demonstrated power beaming at two locations, one at the U.S. Army Research Field at Blossom Point, Maryland, and the other at The Haystack Ultrawideband Satellite Imaging Radar transmitter at the Massachusetts Institute of Technology.

"The reason for setting those targets is to push this technology farther than has been demonstrated before," said Paul Jaffe, power beaming and space solar lead.

"You don't want to use too high a frequency as it can start losing power to the atmosphere," Rodenbeck said. "10 GHz is a great choice because the component technology out there is cheap and mature. Even in heavy rainfall, loss of power is less than five percent.

"In Maryland, the team exceeded their target by 60% by beaming 1.6 kW just over 1 kilometer," he said. "At the Massachusetts site, the team did not have the same peak power, but the average power was much higher, thereby delivering more energy. Jaffe said these demonstrations pave the way for power beaming

on Earth, in space and from space to Earth using power densities within safety limits set by international standards bodies.

“As engineers, we develop systems that will not exceed those safety limits,” Jaffe said. “That means it’s safe for birds, animals, and people.”

Jaffe went on to say that during past experiments with laser power beaming using much higher power densities, the engineers were able to successfully implement interlock systems so if something approached the beam it would turn off.

“We did not have to do that with SCOPE-M because the power density was sufficiently low that it was intrinsically safe,” Jaffe said.

Brian Tierney, SCOPE-M electronics engineer, said the Department of Defense is interested in wireless power beaming, particularly wireless power beaming from space, and that a similar rectenna (rectifying antenna) array as used for SCOPE-M could be used in space. A rectenna is a special type of receiving antenna for converting electromagnetic energy into direct current electricity in wireless power transmission systems.

“Although SCOPE-M was a terrestrial power beaming link, it was a good proof of concept for a space power beaming link,” Tierney said. “The main benefit of space to Earth power beaming for the DoD is to mitigate the reliance on the fuel supply for troops, which can be vulnerable to attack.”

Besides being a DoD priority, Rodenbeck said power beaming is the ultimate green technology. Unlike other sources of clean energy, which provides intermittent and sporadic electrical power, power beamed from space to Earth can provide power continuously, 24 hours a day, seven days a week, 365 days a

year.

“That is something no other form of clean energy can do today,” Rodenbeck said. “From the standpoint of technology readiness level, I feel we are very close to demonstrating a system we can truly deploy and use in a DoD application.”

Honeywell Demonstrates Alternative Navigation Capabilities in GPS-Denied Environments

Honeywell has demonstrated alternative navigation technologies to help ensure seamless navigation even when GPS signals are blocked, using aircraft including an AgustaWestland AW139 helicopter. *HONEYWELL*

PHOENIX – Honeywell has successfully demonstrated several advanced alternative navigation technologies intended to help ensure seamless navigation, even when GPS signals are blocked, interrupted or unavailable, Ahjay Rai of Honneywell said in an April 20 release.

Testing took place on both an Embraer E170 aircraft and an AgustaWestland AW139 helicopter.

Alternative navigation systems use sensors such as cameras, star trackers, radars and radios to augment and or aid inertial navigation systems. These systems correct inertial navigation systems in environments where global navigation satellite systems are denied.

“Our customers are seeing an increase in both intentional and unintentional navigational disruptions, including jamming for GNSS-based navigation,” said Matt Picchetti, vice president and general manager of Navigation and Sensors at Honeywell Aerospace. “There hasn’t been a single set of solutions that meet all our customers’ operational needs, so we decided to create one. Our modular and scalable alternative navigation technologies are setting a new benchmark in terms of reliability and performance in GNSS-denied environments compared with what is available in aviation today.”

Alternative navigation technologies provide position, velocity and heading information in GNSS-denied environments. The successfully demonstrated technologies onboard the E170 and AW139 include:

- Vision Aided Navigation: Honeywell’s Vision Aided Navigation system achieved GPS-like performance on both the Embraer E170 and AW139 platforms during GPS-denied conditions. Additionally, the technology showed 67% improvement in GPS-denied performance compared with earlier testing last year. The system uses a live camera feed and compares it with maps to provide a passive, not

jammable, and highly accurate absolute position.

- Celestial Aided Navigation: Honeywell's Celestial Aided Navigation system on the Embraer E170 achieved an accuracy of 25 meters circular error probability of 50% (CEP50). This represented a 38% improvement in GPS-denied performance compared with tests last year. Most importantly, this is the first time a Resident Space Objects-based (RSOs) navigation solution was demonstrated on an airborne platform, as most competing solutions rely only on star-based navigation. The system utilizes a star tracker to observe stars and RSOs to provide a passive, not jammable solution with GPS-like accuracy in GPS-denied or spoofed conditions.
- Magnetic Anomaly Aided Navigation: Honeywell conducted the world's first real-time magnetic anomaly-aided navigation on an airborne platform, the Embraer E170. This is a historic milestone, as almost all previous magnetic tests were done in special environments to mitigate electromagnetic noise. Honeywell demonstrated this passive, not jammable, all-weather, 24/7 technology on an embedded platform, which measures earth's magnetic strength and compares it with magnetic maps to accurately identify the position of the vehicle.

Additionally, Honeywell demonstrated inertial navigation systems, when paired with the GPSDome (anti-jamming device), showed significant improvement in position accuracy and integrity performance in the presence of GPS jamming. The ability of GPSDome to enable tracking of GPS satellites under more aggressive jamming environments reduces performance degradations that come with GNSS-denied conditions.

Alternative navigation prototype systems will be available in 2022, with initial deliveries expected to start in 2023.

Marine Corps’ King Stallion Ready to Run

U.S. Marines with Marine Heavy Helicopter Squadron (HMH) 461 taxi in a CH-53K King Stallion after its first operational flight at Marine Corps Air Station New River, North Carolina, April 13. The flight signified the beginning of HMH-461’s modernization from the CH-53E Super Stallion to the CH-53K King Stallion. *U.S. MARINE CORPS / Lance Cpl. Elias E. Pimentel III*

ARLINGTON, Va. — The Marine Corps’ new CH-53K King Stallion heavy-lift helicopter achieved initial operational capability on April 22, Deputy Commandant for Aviation Lt. Gen. Mark Wise said in an April 25 release.

The first fleet CH-53K squadron, HMH-461, now has at least four CH-53Ks, the minimum number needed to reach IOC and the

number needed for a detachment to deploy with a Marine Expeditionary Unit.

“In addition to meeting IOC criteria, the CH-53K successfully completed a thorough initial operational test and evaluation period that resulted in over 3,000 mishap free hours flown in various challenging environments and terrain,” the release said.

“My full confidence in the CH-53K’s ability to execute the heavy lift mission is the result of successful developmental and operational testing conducted by Air Test and Evaluation Squadron (HX) 21 and Marine Operational Test and Evaluation Squadron (VMX) 1,” Wise said in the release.

The first deployment of the CH-53K is set for 2024. The Corps plans to field 5.25 fleet HMH squadrons with CH-53Ks. Col. Jack Perrin, the CH-53K program manager, told reporters earlier this month the “.25” is an extra four aircraft for one of the squadrons, with each of the other four squadrons to be equipped with 16 helicopters. Other CH-53Ks will be assigned to a fleet replacement squadron and test squadrons, while others will be in process through the maintenance pipeline.

The Marine Corps’ seven HMH squadrons equipped with the older CH-53E in recent years have operated with only 12 helicopters instead of 16 because of attrition over the years. One CH-53E squadron was deactivated last week and two more will be deactivated in the course of the commandant’s Force Design 2030 plan.

“The success to date of the CH-53K is a reflection of the hard work and effort by the Marines, Sailors and civilians at VMX-1, H-53 Program Office [PMA-261] and Marine Heavy Helicopter Squadron [HMH] 461, and the support we have received over many years from across the Department of the Navy and our industry partners,” Wise said.

The CH-53K is capable of providing nearly three times the lift

capability of the CH-53E.

“The most notable attribute of the King Stallion is its ability to maintain increased performance margins in a degraded aeronautical environment, for example at higher altitudes, hotter climates and carrying up to 27,000 [pounds] out to 110 nautical miles; whereas, the CH-53E would be limited to a 9,628-pound external load in the same environment,” the release said.

“The King Stallion boasts an engine that produces 57% more horsepower with 63% fewer parts relative to its predecessor, which translates to an expanded capability to deliver internal and external cargo loads, providing the commander a mobility and sustainment capability the MAGTF [Marine Air-Ground Task Force] has never had before.”

Supporting the Corps’ Force Design 2030, “the CH-53K will complement connectors that will enable littoral maneuver and provide logistical support to a widely disaggregated naval force.”

The Marine Corps has a requirement for 200 CH-53Ks. Full-rate production is planned for 2023. Full operational capability is scheduled for 2029.