

# World First: Ocean Drone Captures Video from Inside a Category 4 Hurricane



A screen shot from video footage shot by a saildrone inside Hurricane Sam. *SAILDRONE*

ATLANTIC OCEAN – Saildrone Inc. and the National Oceanic and Atmospheric Administration (NOAA) have released the first video footage gathered by an unmanned surface vehicle (USV) from inside a major hurricane barreling across the Atlantic Ocean, the company said Sept. 30.

□The Saildrone Explorer SD 1045 was directed into the midst of Hurricane Sam, currently on a path that fortunately will miss the U.S. East Coast. SD 1045 is battling 50-foot waves and winds of over 120 mph to collect critical scientific data and, in the process, is giving us a completely new view of one of Earth’s most destructive forces.

Equipped with a specially designed “hurricane wing” enabling it to operate in extreme wind conditions, SD 1045 is braving Hurricane Sam in the open ocean, collecting real-time observations for numerical hurricane prediction models, which are expected to yield new insights into how large and destructive tropical cyclones grow and intensify.

SD 1045 is one of a fleet of five “hurricane” saildrones that have been operating in the Atlantic Ocean during this hurricane season, gathering data around the clock to help understand the physical processes of hurricanes. This knowledge is critical to improving storm forecasting and is expected to reduce loss of human life through allowing better preparedness in coastal communities.

“Saildrone is going where no research vessel has ever

ventured, sailing right into the eye of the hurricane, gathering data that will transform our understanding of these powerful storms,” said Richard Jenkins, Saildrone founder and CEO. “After conquering the Arctic and the Southern Ocean, hurricanes were the last frontier for Saildrone survivability. We are proud to have engineered a vehicle capable of operating in the most extreme weather conditions on earth.”

The saildrones provide data directly to NOAA’s Pacific Marine Environmental Laboratory and Atlantic Oceanographic and Meteorological Laboratory, Saildrone’s partners in this mission.

“Using data collected by saildrones, we expect to improve forecast models that predict rapid intensification of hurricanes,” said Greg Foltz, a NOAA scientist. “Rapid intensification, when hurricane winds strengthen in a matter of hours, is a serious threat to coastal communities. New data from saildrones and other uncrewed systems that NOAA is using will help us better predict the forces that drive hurricanes and be able to warn communities earlier.”

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## **Austal USA Establishes Austal West Ship Repair in Alabama**



A commercial ship exiting the Austal West Campus repair facility. *AUSTAL USA*

MOBILE, Ala. – Following the acquisition of additional waterfront along the Mobile River in September 2020, Austal USA quickly established a ship repair facility that has had a booming response, the company said in a Sept. 29 release.

“Almost immediately after word got out Austal USA had purchased the additional waterfront property, we were inundated with calls from commercial captains looking to return to Mobile to have their ships serviced,” said Mike Bell, Austal USA’s senior vice president of operations. “We are pleased with all of the positive feedback we have received from our ship repair customers thus far.”

Austal’s acquisition included 15 acres of waterfront property spanning almost 3,000 linear feet of waterfront pier space, a 20,000-ton certified Panamax-class floating dry dock, a 300,000-square-foot outside fabrication area, and 100,000 square feet of covered fabrication facilities all just 30 miles from the Gulf of Mexico.

While most of the shipbuilding industry associates Austal USA with advanced manufacturing of high-tech Navy ships, many more are now realizing the company has a highly-capable ship repair operation.

The Austal West Campus repair facility is conveniently located across the river from Austal USA’s 165-acre corporate headquarters providing access to deep water berthing for vessels up to 1,000 feet, advanced manufacturing capabilities including a friction stir welder, CNC machines, CNC cutting tables, and a carpenter shop, machine shop and electrical and pipe shops. The repair facility also boasts heavy-lifting capability with mobile cranes, overhead cranes and wing wall cranes that travel the length of the 668-foot dry dock.

The services provided by Austal’s Mobile ship repair operation range from conversions and upgrades to advanced ship repair. The machine shop and fabrication areas are fully equipped with overhead cranes, lathes, and CNC plasma cutters. Other technical services offered to the company’s service clients include full-service detail design capability, 3-D modeling, field engineering support and dimensional accuracy control.

“At Austal USA we have always taken great pride in the quality and value of the new ships we build,” Bell said. “We are now applying that same pride in the quality and value we provide our ship repair clients at our dry dock and repair yard.”

Austal USA has earned a proven reputation as one of the safest shipyards in the industry, a characteristic that is proudly shared with the new service operation. The ISO 9001:2015-certified Austal West Campus is operated by a highly qualified, experienced ship repair and construction management team, focused on safety and customer satisfaction, maintaining a strong professional relationship with all applicable regulatory agencies.

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## **Canadian Technology Companies Create Holographic Sonar Display for Hunting Submarines**



Kongsberg Geospatial and Avalon Holographics have partnered to develop a new holographic sonar display for submarines. *AVALON HOLOGRAPHICS*

OTTAWA, Ontario – Kongsberg Geospatial has partnered with Avalon Holographics to develop a revolutionary holographic sonar display for submarine warfare, in a project funded by the Canadian Department of National Defense IDEaS (Innovation for Defence Excellence and Security) program, Kongsberg said Sept. 29.

The system has been developed to reduce the cognitive load on

passive sonar analysts by visualizing complex undersea environments on a revolutionary new holographic display.

What are sometimes thought of as 3-D displays are actually two-dimensional projections of three-dimensional scenes on a flat monitor. The geometry in the scene is necessarily distorted to create the illusion of looking at a three-dimensional object. To understand what they are looking at, an operator has to manipulate the view to look around the environment.

This is also limiting for situations in which multiple people are looking at the same display. A holographic display would provide a better solution for sharing 3-D information because the view on the data can be individualized, while the image itself remains static.

Avalon Holographics has created just that: a display that uses a complex array of millions of holographic elements or "hogels," to create a true, three-dimensional image that can be clearly seen from different angles without requiring the use of headsets or goggles. This new display will combine passive sonar data with three-dimensional bathymetric data to create an accurate sensor picture that can be used to locate and identify possible undersea threats.

Passive sonars are used by naval ships to locate targets around the platform on which the primary sensor is located, when active sonar is not viable or tactically desirable.

The new holographic sonar display created by Kongsberg Geospatial and Avalon Holographics is designed to increase underwater situational awareness with respect to target detection, supporting faster and more confident decision making when using passive sonar systems. The system will consist of three components: a sonar sensor system, a sonar map rendering system and the holographic display.

The sonar sensor system is located on board a surface vessel which could include a towed array, hull mounted sonar, or sonobuoy receiver. Data from the system is fed to the sonar map rendering system containing the information required to create the operational images to populate the 3-D holographic display.

Kongsberg Geospatial is contributing the sonar map rendering system, a software system that leverages the company's ISR applications, real-time situational awareness capabilities and real-time sensor integration technology. Avalon Holographics will be contributing the holographic display used to visualize the processed data.

"We're excited to be delivering a new and unique user experience on a ground-breaking new display technology for situational awareness," said Randal McGillis, president, Kongsberg Geospatial. "Our battlespace visualization systems draw on our technical legacy with defense system display projects to create a world leading capability to exploit sonar data and will help users to more effectively exploit complex sensor data."

"Our ground-breaking holographic display technology applies to a wide range of applications, but the battlespace has always been a primary user focus," said Russ Baker, cofounder, Avalon Holographics. "Together, Kongsberg's TerraLens and Avalon's Raydiance Engine are pioneering a new class of holographic situational awareness applications to transform 3-D battlespace visualization, GIS and underwater warfare. These bold steps are just one way we're transforming the science-fiction of holographic visual experiences into science fact."

The initial phase of the IDEaS project will run until November, during which time Avalon Holographics will be

refining the performance of the display device, improving the software tools, and working with Kongsberg on software integration. Kongsberg Geospatial will be developing trials of different use cases for the systems including multi-sensor operations and target motion analysis. The goal is to proceed to the next phase of the project, which would involve enhancement of Kongsberg's software, a more comprehensive integration with the display and porting to Avalon's next-generation display technology.

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## Navy Inaugurates New Next-Gen Air Combat Training System



The Tactical Combat Training System Increment II (TCTS Inc. II) pod on its first flight on a test F/A-18 aircraft over Patuxent River, Maryland, in February. *U.S. NAVY*

PATUXENT RIVER, Md. – The Navy's Naval Aviation Training Systems and Ranges program office's (PMA-205) Tactical Combat Training System Increment II (TCTS Inc. II) and Advanced Naval Technology Exercise (ANTX)-21 teams conducted their first live-virtual-constructive (LVC) demonstration in an operational environment last month, the Naval Air Systems Command said Sept. 27.

As part of the Navy's broader initiative to enhance capability, the event displayed early LVC capability for the TCTS Inc. II system and included many "firsts" in naval aviation training.

The ANTX-21 fleet demonstration simultaneously connected both fleet and test F/A-18 and EA-18G aircraft, an F/A-18

simulator, an operational destroyer, a guided missile from the ship pier side, the Joint Semi-Automated Forces system, and the Next Generation Threat System all via the Navy Continuous Training Environment (NCTE). This exercise was naval aviation's first demonstration of TCTS II in an operational environment, proving to be a simultaneous, multi-system, and multi-domain integrated warfighting training capability. The demonstration results will be used to further determine how TCTS Inc. II and LVC will be implemented effectively and efficiently in naval aviation training.

"While watching ANTX-21 unfold across the globe from Navy Warfare Development Command in Norfolk, Va., I had an opportunity to see and hear the Navy's excited reaction to TCTS Inc. II at the operation's center," said PMA-205 program manager, Capt. Lisa Sullivan. "On the surface side, ships have been using a training LVC mode for a while, networking back and forth to exercise coordinators running complex scenarios. Now aviation is part of the mix through validation of TCTS Inc. II as the host system connecting live aircraft into a LVC environment."

The early LVC capability on the TCTS Inc. II system displayed during the event demonstrated successful integration of the system with the training environment, including simulated threats controlled by JSAF over NCTE, live aircraft air-to-air engagements, and integration with an F/A-18 simulator at the manned flight simulator facility.

Chuck Kaylor, the PMA-205 TCTS Inc. II team lead, said the event included several firsts for naval aviation training. It was the first flight of TCTS Inc. II pod on an operational fleet aircraft, the first time TCTS Inc. II was used to create a LVC surface-to-air engagement, the first virtual F/A-18 engaged with a simulated/constructive aircraft, and the first pier side operational ship receiving and engaging with TCTS Inc. II information.

“TCTS Inc. II is a critical enabler of Navy LVC, helping to close competition gaps in both operational security and training capabilities for the high-end fight, and this event comes with TCTS II already in production and approximately one year prior to initial operational capability” said Kaylor.

The program office in coordination with U.S. Fleet Forces Command, U.S. Pacific Fleet, and U.S. Naval Forces Europe conducted this exercise, which was designed to refine how the U.S. Navy synchronizes maritime operations across multiple fleets, in support of the joint force. The training is based on a progression of scenarios that will assess and refine modern warfare concepts, including distributed maritime operations, expeditionary advanced base operations, and littoral operations in a contested environment. This is the first iteration of what will become a triennial exercise with plans for future iterations to include partners and allies from around the world.

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## **SURFLANT Stands Up Task Group Greyhound**



Task Group Greyhound was formally introduced by Rear Adm. Brendan McLane, commander, Naval Surface Force Atlantic, and Rear Adm. Brian Davies, commander, Submarine Group Two and deputy commander, 2nd Fleet, at an event held at Naval Station Mayport aboard the guided-missile destroyer USS Thomas Hudner (DDG 116), Sept. 27. *U.S. NAVY*

MAYPORT, Fla. – Task Group Greyhound was formally introduced by Rear Adm. Brendan McLane, commander, Naval Surface Force Atlantic, Rear Adm. Brian Davies, commander, Submarine Group Two and deputy commander, 2nd Fleet, at an event held at Naval

Station Mayport aboard the guided-missile destroyer USS Thomas Hudner (DDG 116), Sept. 27, said Lt. j.g. Caroline Leya, SURFLANT public affairs.

Task Group Greyhound (TGG) is a force generation initiative within the Optimized Fleet Response Plan, the standard ship cycle construct that guides a roughly 36-month readiness roadmap. It is designed to provide the fleet with continuously ready, fully certified warships ready to accomplish a full range of on-demand missions at all times. TGG will assign and task Arleigh Burke-class guided-missile destroyers to be at-the-ready to support sustainment operations and to counter Russian undersea threats to the homeland.

The day's event comprised of a cake-cutting, a virtual media availability and an anti-submarine warfare scenario conducted for the official party in the combat information center aboard Thomas Hudner.

McLane gave a Bravo Zulu to the first two TGG ships, Thomas Hudner and the guided-missile destroyer USS Donald Cook (DDG 75), and emphasized that maintaining an undersea warfare edge over Russian submarines off the East Coast is a growing priority.

"Task Group Greyhound provides us a way to increase continuity between training and operating against high-end competitors in a dynamic environment," McLane said. "These destroyers are now designated under Task Group Greyhound in the western Atlantic on watch 24/7 ready to practice, integrate, and operate at a moment's notice."

Facing the considerable threat from Russia requires focus, continuous monitoring and a team approach to undersea warfare. The TGG initiative will ensure that designated post-deployment East Coast destroyers remain in an extended sustainment phase on a rotating basis with other destroyers. This will be

supported by incremental maintenance availabilities and sustained readiness certifications.

The TGG model is a reference to the World War II destroyers, or “Greyhounds of the Fleet,” that patrolled the seas in the “Battle of the Atlantic.” The modern version is similar to how readiness is maintained aboard forward deployed naval forces in Spain.

Cmdr. Bo Mancuso, Thomas Hudner commanding officer, acknowledged the importance of the initiative and of his command being selected to take the first watch.

“Being chosen as one of the initial ships to serve in this capacity is humbling, and a big responsibility that we are more than ready to honor,” Mancuso said. “It was our pleasure to host Rear Adm. McLane today and show him what we’re capable of and that our crew is up to the task.”

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## **DARPA’S Hypersonic Air-Breathing Weapon Concept Achieves Successful Flight**



*An artist’s conception of the Hypersonic Air-breathing Weapons Concept (HAWC) missile. RAYTHEON MISSILES & DEFENSE*

ARLINGTON, Va. – DARPA, in partnership with the U.S. Air Force, completed a free flight test of its Hypersonic Air-breathing Weapon Concept (HAWC) last week, the agency said in a Sept. 27 release.

The missile, built by Raytheon Technologies, was released from an aircraft seconds before its Northrop Grumman scramjet (supersonic combustion ramjet) engine kicked on. The engine compressed incoming air mixed with its hydrocarbon fuel and began igniting that fast-moving airflow mixture, propelling the cruiser at a speed greater than Mach 5, or five times the speed of sound.

The HAWC vehicle operates best in oxygen-rich atmosphere, where speed and maneuverability make it difficult to detect in a timely way. It could strike targets much more quickly than subsonic missiles and has significant kinetic energy even without high explosives.

“The HAWC free flight test was a successful demonstration of the capabilities that will make hypersonic cruise missiles a highly effective tool for our warfighters,” said Andrew “Tippy” Knoedler, HAWC program manager in DARPA’s Tactical Technology Office. “This brings us one step closer to transitioning HAWC to a program of record that offers next generation capability to the U.S military.”

Goals of the mission were vehicle integration and release sequence, safe separation from the launch aircraft, booster ignition and boost, booster separation and engine ignition and cruise. All primary test objectives were met.

The achievement builds on pioneering scramjet projects, including work on the X-30 National Aero-Space Plane as well as unmanned flights of NASA’s X-43 vehicles and the U.S. Air Force’s X-51 Waverider.

“HAWC’s successful free flight test is the culmination of years of successful government and industry partnership, where a single, purpose-driven team accomplished an extremely challenging goal through intense collaboration,” Knoedler added. “This historic flight would not have been possible without the dedication of industry, U.S. Air Force, and Navy

flight test personnel who persevered through the pandemic to make the magic happen.”

The HAWC flight test data will help validate affordable system designs and manufacturing approaches that will field air-breathing hypersonic missiles to our warfighters in the near future.

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## **Boeing Awarded Contract for Five P-8A Aircraft for Germany**



Boeing has been awarded a production contract for five P-8A Poseidon aircraft for Germany. *BOEING*

ARLINGTON, Va. –The U.S. Navy awarded Boeing a production contract for five P-8A Poseidon aircraft for Germany, the company said Sept. 28. First deliveries are slated to begin in 2024 when the P-8A Poseidon will eventually replace Germany’s fleet of P-3C Orion aircraft.

“We’re pleased to have finalized this sale to Germany and to expand our footprint in-country by bringing the P-8A and its unique multi-mission capabilities to the German Navy,” said Michael Hostetter, vice president, Boeing Defense, Space & Security, Germany. “The P-8 will ensure the German Navy’s ability to perform long-range maritime surveillance missions and will play a pivotal role in the region by leveraging existing infrastructure in Europe and full interoperability with NATO’s most advanced assets.”

German industry is a critical partner with the P-8A Poseidon

program. By working with local partners, Boeing will provide support, training and maintenance solutions that will bring the highest operational availability to fulfill the German Navy's missions. On June 17, Boeing signed agreements with ESG Elektroniksystem-und Logistik-GmbH and Lufthansa Technik AG to collaborate in systems integration, training, and sustainment work. German companies that currently supply parts for the P-8A include Aircraft Philipp Group GmbH, Aljo Aluminium-Bau Jonuscheit GmbH and Nord-Micro GmbH.

"With strategic agreements and industry partnerships already in place, we stand ready to deliver a robust sustainment package for the German Navy's P-8A fleet," said Dr. Michael Haidinger, president, Boeing Germany, Central & Eastern Europe, Benelux and Nordics. "Together with the German Navy, the Federal Ministry of Defense and local industry, we will ensure maximum operational availability that will allow the German Navy to meet the full range of its maritime challenges."

Deployed around the world with more than 135 aircraft in service, and over 350,000 collective mishap free flight hours, the P-8A will significantly advance Germany's antisubmarine warfare, antisurface warfare, intelligence, surveillance and reconnaissance and search and rescue mission capabilities.

Germany is the eighth nation to have acquired the P-8A, joining the United States, Australia, India, the United Kingdom, Norway, Korea and New Zealand.

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## **Coast Guard Nabs 2 Smugglers,**

# Seizes \$7.5 million in Cocaine in Caribbean Sea



Coast Guard Cutter Kathleen Moore interdicted a drug smuggling go-fast vessel in the Caribbean Sea with 250 kilograms of cocaine and the crew apprehended two smugglers Sept. 25, 2021, in waters south of the Dominican Republic. *U.S. COAST GUARD* SAN JUAN, Puerto Rico – The Coast Guard Cutter Reef Shark transferred custody of two smugglers and offloaded approximately 250 kilograms cocaine at Coast Guard Base San Juan Saturday, following Coast Guard Cutter Kathleen Moore's interdiction of a go-fast smuggling vessel in the Caribbean Sea, the Coast Guard 7th District said Sept. 27.

The apprehended smugglers are Dominican Republic nationals, who were charged with possession with intent to distribute cocaine aboard a vessel subject to the jurisdiction of the United States. The cocaine seized has an estimated wholesale value of approximately \$7.5 million. U.S. Coast Guard Special Assistant United States Attorney Jordan H. Martin is in charge of the prosecution of this case.

The interdiction resulted from multi-agency efforts in support of U.S. Southern Command's enhanced counter-narcotics operations in the Western Hemisphere and coordination with the Caribbean Corridor Strike Force.

During a routine patrol Wednesday, a U.S. Maritime Enforcement Aircraft detected a suspect go-fast vessel, approximately 145 nautical miles south of the Dominican Republic. Coast Guard watchstanders in Sector San Juan diverted the cutter Kathleen Moore to carry out the interdiction. With the assistance of the cutter's small boat, the crew of the Kathleen Moore interdicted the 25-foot vessel that was carrying two men and 10 bales of suspected contraband onboard, which tested positive for cocaine.

“The crew did a great job working with interagency partners and Coast Guard watchstanders preventing this drug smuggling go-fast from making landfall,” said Lt. Andrew R. Collins, cutter Kathleen Moore commanding officer. “We are glad to help keep these drugs off the streets, and we will continue to work diligently with fellow Coast Guard units and our interagency partners to stop these drug-smuggling attempts in the high seas.”

The seized drugs and detainees were transferred to the Coast Guard Cutter Heriberto Hernandez and then to the Coast Guard Cutter Reef Shark for transport to Puerto Rico, where federal law enforcement agents from the Caribbean Corridor Strike Force received custody.

Cutters Kathleen Moore and Heriberto Hernandez are 154-foot fast response cutters respectively homeported in Key West, Florida, and San Juan, Puerto Rico. Cutter Reef Shark is an 87-foot coastal patrol boat homeported in San Juan, Puerto Rico.

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## **NAVFAC Northwest Awards \$21M Contract for Shipyard Facility Upgrades**



Puget Sound Naval Shipyard in Bremerton, Washington, is home to one of seven Defense Logistics Agency Land and Maritime’s detachments. *DEFENSE LOGISTICS AGENCY LAND AND MARITIME / Gary T. Sutto*

SILVERDALE, Wash. – Naval Facilities Engineering Systems Command (NAVFAC) Northwest awarded a \$21 million contract

Sept. 13 for seismic repairs and life safety improvements to building 431 at Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF), Washington, the command announced Sept. 24.

Building 431, used to repair and test ship parts, was built in 1934, with an addition built in 1943.

“This award action is a continuing example of NAVFAC strengthening our shore installations through seismic resiliency and better positions our shipyard infrastructure for the advancement of naval lethality,” said NAVFAC Northwest Commanding Officer Capt. Ben Miller. “I am very pleased by the team effort to award the contract and look forward to working with our contractor partners to get this important project underway.”

The work to be performed includes demolition, abatement, excavation, placement of micropiles, reinforcement of existing pile caps, placing grade beams and concrete slabs, reinforcing walls, among others, and salvage and reinstallation of existing government-owned equipment.

“Our partnership with NAVFAC Northwest is vital to our mission success,” said PSNS & IMF Commanding Officer Capt. Jip Mosman. “This project is the continuation of several phased projects to repair building 431. Infrastructure upgrades are an important step in providing world-class facilities to the workforce and ensuring the shipyard’s ability to maintain, modernize and retire the Navy’s fleet for decades to come.”

Work will be performed in Bremerton, Washington, and is expected to be completed by August 2023. Fiscal 2021 operation and maintenance (Navy) funds in the amount of \$20.8 million are obligated on this award. Jabez-Absher-1, a Joint Venture, of Orting, Washington, received the award.

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# Boeing Delivers First Operational Block III F/A-18 Super Hornet to the U.S. Navy



Boeing has delivered the first of 78 contracted Block III F/A-18 Super Hornets to the U.S. Navy. *BOEING*

ARLINGTON, Va. – Boeing has delivered the first of 78 contracted Block III F/A-18 Super Hornets to the U.S. Navy, the company said in a Sept. 27 release. Block III gives the Navy the most networked and survivable F/A-18 built with a technology insertion plan that will outpace future threats.

“The fleet needs capabilities to keep its edge,” said Capt. Jason “Stuf” Denney, U.S. Navy F/A-18 and EA-18G program manager. “Getting the first operational Block III in our hands is a great step forward in supporting our capability and readiness goals.”

Capabilities of the Block III include the advanced cockpit system with a 10-inch-by-19-inch touch screen display, enhanced networking, open mission systems, reduced radar signature and a 10,000-hour airframe.

Block III’s new adjunct processor translates to a fighter that will do more work and in far less time increasing a pilot’s situational awareness. The jet is ready to receive apps-based solutions that will allow upgrades to the aircraft throughout its life span.

“We invested in Block III technology and developed the capabilities in partnership with the U.S. Navy to meet its emerging requirements,” said Jen Tebo, Boeing vice president

of F/A-18 and EA-18G programs. "The hardware upgrades are complete. Today we are maximizing the open hardware and software and developing the apps to keep Block III ahead of future threats. We are giving Navy pilots the tools to make the fastest and most informed decisions possible now and in the future."

Boeing will continue to deliver Block III capabilities to the Navy through the mid-2030s from three lines. One new build production, and two Service Life Modification lines extending the life and eventually upgrading Block II Super Hornets to Block III. The first aircraft delivered will complete the U.S. Navy flight test program before deploying to a squadron.