Remote Maintenance System Kits on Track to Fleet Deployment

Raquel Parker, a logistics management specialist with Naval Surface Warfare Center, Port Hueneme Division's logistics outfitting branch, packs Augmented Reality Maintenance System (ARMS) kits for shipment to the U.S. Navy's Aegis Ashore Missile Defense sites in Poland and Romania, Aug. 14. Though not part of her regular tasking, Parker was asked to assist with procuring and assembling the kit items, as well as shipping them to all forward-deployed naval forces before the end of the fiscal year.

Story by Teri Carnicelli, Sept. 9, 2025

OXNARD, Calif. – Naval Surface Warfare Center, Port Hueneme

Division’s (NSWC PHD) Augmented Reality Maintenance System (ARMS) team sent out more than 20 ARMS kits to the fleet in August, putting it closer to meeting command leadership’s goal of ARMS on every deployed ship.

“Our highest priority, based on feedback from (Commanding Officer) Capt. (Tony) Holmes, is to make sure that every deploying ship in the fleet pulls away from the pier with ARMS capability,” said Matt Cole, NSWC PHD ARMS project lead. “So far, we have been accomplishing that by targeting deploying carrier strike groups like the USS Nimitz (CVN 68) and USS Gerald R. Ford (CVN 78) groups. But our current round of fielding is rolling out capability to all our forward-deployed naval forces (FDNF) ships in places like Rota, Spain, and Yokosuka, Japan.”

The ARMS kits left the command in mid-August, heading to more than a dozen FDNF ships in the 6th and 7th Fleets. Additional kits were sent to the Navy’s Aegis Ashore Missile Defense sites in Poland and Romania for installation before the end of the calendar year.

According to Chris Black, NSWC PHD rapid prototyping experimentation and demonstration lead, the command also sent kits to the Iwo Jima Amphibious Ready Group and its lead ship USS Iwo Jima (LHD 7).

Using the ARMS kit, shipboard maintainers can contact a shore-based subject matter expert (SME) in real time with audio, video and text chat so the remote expert can see and hear what the Sailor is experiencing.

“We anticipate funding from Commander, Naval Air Force, U.S. Pacific Fleet (CNAP) and Commander, Naval Surface Force, U.S. Pacific Fleet (SURFPAC), and we will meet the end-of-month deadline to have ARMS on all FDNF ships,” said Black, who is overseeing the deployment of the ARMS kits.

“The ARMS team is actively working toward getting program sponsorship, but while the program is still in the development phase, we are receiving funding from the various type commanders like CNAP and SURFPAC that eagerly want this technology aboard their ships,” he added.

Cole said that the ARMS team’s intent is to reach 100% of those set to deploy, or already deployed by the first quarter of next fiscal year.

“We also want to push our installations on ships a little earlier in the deployment cycle so Sailors can train with ARMS before they deploy,” Cole said.

Collaborative efforts

ARMS team members also continue to collaborate with other systems commands (SYSCOMs) involved in developing and deploying ARMS, including Naval Air Systems Command (NAVAIR) and Naval Information Warfare Systems Command (NAVWAR). NAVAIR developed the software that NSWC PHD combined with commercial off-the-shelf hardware to create and ultimately field ARMS.

Representatives of both SYSCOMs attended a three-day meeting in July that the command hosted to discuss the overall ARMS fielding strategy, network integration requirements, metrics capturing, sponsorship options and more.

“The metrics that we are getting from Sailors and SMEs are going back to us as well as the NAVAIR software developers to improve the hardware and total kit,” said computer scientist Nick Bernstein, ARMS engineering lead.

So far, metrics from nine ARMS-assisted shipboard maintenance events have been collected, showing a 92% reduction in SME time by using ARMS and a 94% cost avoidance, versus

traditional shipboard support.

“Part of the discussion was focused on programmatics – how are we capturing metrics to tell the story of ARMS’ impact, and how we can improve what we’re capturing,” Bernstein said.

Those metrics and feedback also fed into the development of the next version of the ARMS kit, he said.

“We dug into requirements and use cases that each SYSCOM would like to prioritize as capabilities in the next version of the kit,” Bernstein said.

Using the feedback received, the ARMS team ranked priorities for software and hardware development over the next six months.

During the meeting, members of the command’s waterfront logistics division briefed the group on the logistical aspects of procuring, assembling and deploying the kits.

“Big picture, the goal of this meeting was to unite all the stakeholders on the requirements of the system and resources for the short-term and long-term plans for this program,” Bernstein said.

“Building these cross-organizational relationships will be key to help the program succeed as we all communicate a bit better and have a more common understanding,” he added.

Long-term sustainment

All three SYSCOMs, including Naval Sea Systems Command, have also been working toward developing an estimated program cost, with a range between barebones support and full-court press to field across the fleet over the next few years, until a formal Program Objective Memorandum dedicates program funding to

ARMS, Bernstein said.

“We discussed who our potential sponsors are and which SYSCOM makes the most sense as the primary ARMS home,” he said. “There are still some open questions from this portion of the meeting, but we captured the plans for what’s next.”

Finding a permanent sponsor is just one goal of the long-term sustainment plan for ARMS, according to Cole. What started as a Naval Innovation Science and Engineering-funded research project under NSWC PHD’s Office of Technology has now grown into a full-blown program with several areas of command support.

“We have been building out the team into multiple technical swim lanes, with different departments leading the development of ARMS and overseeing fielding and product support,” Cole said.

In addition to the departments, Cole said the ARMS team has worked closely with the command’s Office of Engineering and the Fleet Readiness Office to set up an operations team to respond to day-to-day fleet support demands for ARMS.

“Every one of these teams also includes important contributions from our partners in NAVAIR and NAVWAR,” Cole said. “These improvements to our team structure and bench strength will be key as we take ARMS from a success story in rapid technology transition to a success story in long-term fleet capability.”

Looking ahead, the team is already developing the next versions of the ARMS kit, due in large part to fleet and SYSCOM feedback.

“This major version upgrade will bring important software fixes and hardware improvements, as well as several highly

requested features like multi-way calling and greater portability," Cole said.

"Our goal is to have these improvements out in the early part of next calendar year," he said. "We're tremendously grateful to the many dozens of people across NSWC PHD and external commands who have pulled out all the stops to help us accelerate (ARMS') capability to the fleet."