# Advanced 3-D Printing Allows Marines Quick Material Production in the Field

QUANTICO, Va. – From a small plastic clip that keeps a snowshoe fastened to a multi-ton concrete replacement bridge and a wide range of items in between, Marines are using advanced manufacturing, commonly called 3-D printing, to produce in the field or in garrison rather than waiting days or weeks for the normal supply system to respond.

“We’re going hot and heavy” into advanced manufacturing, using materials from plastic to aluminum and other metals and even concrete, Capt. Matthew Friedell, the team leader on advanced manufacturing in the Rapid Sustainment Office at Marine Corps Systems Command said Feb. 7.

Systems Command has sent more than 100 3-D printers to Marine units,
mostly small, desktop size instruments, but also a number of mid-size
devices in 20-foot shipping containers and three huge machines at the
Marine supply depots, Friedell told reporters in a telephone conference
call from Marine Corps Base Quantico, Va. Some of the printers, called
tactical fabricating kits, are in the hands of infantry units, he
said.

They also send training teams to help the field units learn how to use their new equipment and provide a support service that can develop the data required to produce the needed item

and email it to the requesting unit, Friedell said.

Other crucial services the SysCom office provides are conducting tests of the material needed for the item to determine if it can be safely printed by the field unit, and studies of the original commercial source of the item to protect the company's intellectual property rights, he said.

Industry has been very cooperative, but their data rights need to be protected, he said.

But most of the time, the request is for five to 10 small parts, for which there is no real profit interest for the producer. And often the needed item is no longer being produced due to the age of the equipment being repaired.

Items produced by Marines using 3-D printers cited by Friedell and other Marine officials include the snowshoe clip, a plastic buckle on a backpack, a compressor blade for an M-1 tank and a heavy concrete footbridge built by a Marine engineer unit in a test.

The long-term thrust for 3-D printing, Marine officials have said, is to greatly improve the ability of small combat units, well separated from senior commands and supply sources under the distributed forces concept, to sustain themselves by producing critically need parts.

Flexibility is another key contribution of the printers, Friedell said, noting that the prototype machine that produced the concrete bridge could also produce a security barrier or a shelter.

Electrical power is a crucial consideration, Friedell said, because the larger printers require huge amounts of power. Current tactical generators are able to provide the needed power and the services are developing hybrid power sources that combine high-efficiency generators with powerful batteries that can reduce the fuel demands of running the generators.

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# Analyst: Navy Needs to Re-Configure Carrier Air Wings for Future Fight

WASHINGTON – The Navy needs to change the structure of its future carrier air wings (CVWs) in the future to meet future threats, particularly in high-end combat against potential adversaries such as China and Russia, a team of defense analysts said in a published report.

"If the U.S. Navy is going to continue to invest in aircraft carriers, it need to re-consider how it's going to configure its [carrier] air wings," said Bryan Clark, a senior fellow at the Center for Strategic and Budgetary Assessments, a Washington think tank, speaking Feb. 7 at the center about the new report, Regaining the High Ground at Sea: Transforming the U.S. Navy's Carrier Air Wing for Great Power Competition.

The Navy's current CVW "is not designed for the way we're going to

operate in the future," Clark said. "I would even go further to say,
unless the Navy is going to re-configure its air wings, it should
reconsider its continued investment in aircraft carriers."

Clark briefed the audience on worst-case scenario where an adversary such as China could launch a salvo of 600 1,000-pound-class weapons at a carrier strike group and recommended the type of defenses, including a CVW, that would be needed for a carrier to operate in the ocean in a high-end fight.

The report said that today's CVWs "lack the reach to operate at sufficient ranges from operational areas; the stealth to fight in contested environments; and the specialized capabilities in IRS&T [infrared search and track], EMW [electromagnetic warfare], and ASW [anti-submarine warfare] needed to defeat adversary platforms and systems."

Clark sees the need for a CVW to move toward including more unmanned aircraft. He recommended development of three new aircraft types: an unmanned air combat vehicle (UCAV); an unmanned refueling aircraft, initially the MQ-25; and FA-XX, a new fighter with a longer strike range.

The report's recommendations for re-configuring the carrier air wing by 2040 include:

* Sustaining planned procurement of the F/A-18E/F strike fighter through fiscal 2023.

* Sustaining procurement of the F-35C strike fighter through the first half of its planned production, ending in fiscal 2024.

* Develop an FA-XX fighter, a derivative of an existing fighter, by 2024.

* Develop a low-observable UCAV attack aircraft for production

by 2025.

* Continue development of the MQ-25 aerial refueling UAV and increase overall number of tanker aircraft to 12 per air wing. Also,
develop the UCAV as a tanker for the mid-to-late 2030s.

* Retire the EA-18G electronic attack aircraft as they reach the
end of their service lives during the 2030s and replace them with
UCAVs equipped with the Next-Generation Jammer and also with expendable UAVs and missiles.

* Field a rotary wing MALE [medium-altitude, long-endurance] UAV
(in concert with the Marine Corps) to augment the carrier-based
helicopter squadrons and assume some of the ASW missions.

Clark’s team for the report included Adam Lemon, Peter Haynes, Kyle Libby and Gillian Evans.

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# Coast Guard Offloads 34,780 Pounds of Cocaine in Port Everglades

MIAMI – The crew of the Coast Guard Cutter Forward (WMEC-911) offloaded approximately 34,780 pounds of cocaine Feb. 5 in Port Everglades worth an estimated $466 million wholesale seized in international waters in the Eastern Pacific Ocean,

the Coast Guard 7th District said in a release of the same date.

The drugs were interdicted off the coasts of Mexico, Central, and South America and represent 21 separate suspected drug smuggling vessel interdictions by the U.S. Coast Guard.

The cutter Forward was responsible for eight cases seizing an estimated 14,207 pounds of cocaine. The Coast Guard Cutter Hamilton (WMSL-753) was responsible for five cases, seizing an estimated 9,460 pounds of cocaine. The Coast Guard Cutter Campbell (WMEC-909) was responsible for four cases, seizing an estimated 6,153 pounds of cocaine. The Coast Guard Cutter Alert (WMEC-630) was responsible for two cases, seizing an estimated 5,736 pounds of cocaine. The Coast Guard Cutter Venturous (WMEC-625) was responsible for one case, seizing an estimated 1,565 pounds of cocaine. The Coast Guard Cutter Confidence (WMEC-619) was responsible for one case seizing an estimated 553 pounds of cocaine.

“The interdiction and disruption of more than 17 tons of cocaine is a result of the collaboration and coordination of multiple Coast Guard and interagency assets to address the complex maritime challenge of transnational criminal organizations,” said Cmdr. Michael Sharp, commanding officer of the cutter Forward. “I am extremely proud of all the women and men that contributed to the mission success, it is a direct reflection of how the U.S. Coast Guard delivers mission excellence anytime, anywhere.”

Numerous U.S. agencies from the Departments of Defense, Justice and Homeland Security are involved in the effort to combat transnational organized crime. The Coast Guard, Navy, Customs and Border Protection, FBI, Drug Enforcement Administration, and Immigration and Customs Enforcement along with allied and international partner agencies play a role in counter-drug operations. The fight against transnational organized crime networks in the Eastern Pacific requires unity

of effort in all phases from detection, monitoring and interdictions, to prosecutions by U.S. Attorneys in Florida, California, New York, the Gulf Coast, Puerto Rico and elsewhere.

The Coast Guard increased U.S. and allied presence in the Eastern Pacific Ocean and Caribbean Basin, which are known drug transit zones off of Central and South America, as part of its Western Hemisphere Strategy. During at-sea interdictions in international waters, a suspect vessel is initially located and tracked by allied, military or law enforcement personnel. The interdictions, including the actual boarding, are led and conducted by U.S. Coast Guardsmen. The law enforcement phase of counter-smuggling operations in the Eastern Pacific are conducted under the authority of the Coast Guard 11th District headquartered in Alameda, California.

The cutter Forward is a 270-foot medium-endurance cutter homeported in Portsmouth, Virginia. The cutter Hamilton is a 418-foot national security cutter homeported in Charleston, South Carolina. The cutter Campbell is a 270-foot medium endurance cutter homeported in Portsmouth, New Hampshire. The cutter Alert is a 210-foot medium-endurance cutter homeported in Astoria, Oregon. The cutter Venturous is a 210-foot medium-endurance cutter homeported in St. Petersburg, Florida. The cutter Confidence is a 210-foot medium-endurance cutter homeported in Port Canaveral, Florida.

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# Army Corps Awards Contract to Widen, Deepen Corpus Christi

# Ship Channel

CORPUS CHRISTI, Texas – The U.S. Army Corps of Engineers has been awarded a contract to deepen the Port of Corpus Christi ship channel.

Great Lakes Dredge & Dock Co. received a $93 million construction contract on Jan. 4, to deepen and widen the Corpus Christi Ship Channel from the Gulf of Mexico to Harbor Island, as part of the first phase of the port's $326 million Channel Improvement Project (CIP).

Corpus Christi is the largest crude oil port in the United States and handles both imports and exports. The port exports about 100 million tons annually.

Charles W. Zahn, chairman for the Port of Corpus Christi Commission said the deeper channel "will allow larger vessels access to much needed export facilities, safely and responsibly."

The dredging will deepen the entire ship channel to 54 feet from 45 feet and widen it to 520 feet from 400. The full project, which will be completed in phases and take about five years, will permit two-way supertanker traffic, including very large crude carriers (VLCCs), which can carry up to 2 million barrels of crude oil. Great Lakes will start this first phase later this year, which will take about a year to complete.

"We commend the Army Corps of Engineers for progressing the highly anticipated Corpus Christi Ship Channel Improvement Project, and the selection of Great Lakes Dredge & Dock to perform on this first contract is an extraordinary step forward in positioning the United States as the largest exporter of energy in the world," said Sean Strawbridge, CEO for the Port of Corpus Christi.

The CIP will result in the first shore-based VLCC terminal in the U.S. The only other terminal is located offshore.

Based in Oak Grove, Illinois, Great lakes is America’s largest dredging contractor, although much of its work is international.

“We are confident that this will drive the much-anticipated future investment and development in the port,” said Lasse Petterson, CEO of Great Lakes. “It all starts with dredging.”