National DEFENSE

SPECIAL REPORT

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INTRODUCTION

Putting the Right Special Ops Tech in the Right Hands

BY JAMES H. SMITH

A few decades ago, I went through the Army's Ranger School — okay, maybe several decades ago. One of the most important lessons I learned is that every operation starts with a good plan and, conversely, it's hard to recover from a bad plan.

If you know there are going to be obstacles along your route, you need to have a plan to negotiate those obstacles. If you know there will be a river between you and your objective, you better bring a rope and have your team rehearsing how to build rope bridges before you depart. You don't stumble upon a river, throw your hands up and proclaim it to be the "River of Death."

So why has the phrase "Valley of Death" staked such a strong claim in our defense acquisition canon? To be sure, there are valleys in our acquisition process, but they are there for a reason. Not every concept should cross over to become a prototype. Not every prototype should cross over to become a product, and not every product should be produced at scale. Some ideas just don't warrant continued investment by the government, and that's okay. In fact, the earlier we determine that, the better it is for the taxpayer and the better it is for industry partners.

It is a problem, however, when good concepts, prototypes and products don't make it across the valleys when they should. These relevant ideas need assistance. They need a plan — a rope bridge — across the valley, which only becomes a valley of death if you don't have a plan.

At Special Operations Command, we're committed to teaming with industry partners to provide those rope bridges. We've invested in several bridges for use both by our veteran industry partners who have been across the valley before, and especially to our new partners that aren't familiar with the obstacles.

Let's assume that every effort shares the same objective: to enter production at scale. If true, then we should always start with that end in mind. We need to envision success and set the conditions to achieve that success.

The first rope bridge is the socom.mil website, which explains that the command uniquely manages all phases of the acquisition process under one roof: science and technology to programs of record to sustaining those programs over their lifecycle. That means we own all the valleys, too. We're responsible for identifying good technology, maturing that technology, getting that technology into production and fielding it to our operators. We can't blame someone else for the valleys; they are our valleys.

We have some great bridges for the first valley you may need to cross: concept to prototype. And most of these bridges help with the subsequent pitfalls as well.

For great concepts, a sturdy bridge for this first valley is Small Business Innovation Research Phase 1 funding. Phase 1 is for white papers, which if successful, proceed to Phase 2 prototyping efforts. Of our Phase 1 efforts, 59 percent go on to Phase 2. Why is that? Because each of our SBIRs is sponsored by one of our program managers who asked for the technology and needs vendors to be successful for their program to be successful. The SBIR Phase 1 rope is pulling ideas across the first valley.

For this first valley, we also offer an online tool — eSOF, which allows submissions that garner one of several responses. We may tell you that we aren't interested, either because your proposal isn't unique to Special Operations Forces or because we're already invested in a similar capability. Remember, not every concept should cross the valley. The responsiveness of eSOF allows you to get that answer rapidly at very little cost to you. About 10 percent of eSOF proposals do get invited to either submit additional information or provide a briefing.

If 10 percent doesn't sound high, I would highly encourage potential vendors to contact our Office of Small Business Programs. Their reason for existence is to provide ropes to our small business partners and, like true sherpas, they may be able to guide you to the best crossing sites. They can give you tips for your eSOF proposal, discuss pitfalls to avoid, or may be able to show you other opportunities. These sherpas have helped the command exceed small business goals every year and set new records for dollars awarded to small businesses in fiscal year 2022.

Many of the ropes we've discussed will help good technology needed by special operators to cross the next valley into production. If it is a game-changing technology, our SOFWERX platform provides a low barrier-of-entry sounding board for your capability. SOFWERX facilitates collaboration events, assessment events and Tech Tuesday presentations, all of which are great opportunities to introduce us to prototypes with the potential to be awarded a commercial business-to-business agreement after evaluation and selection by stakeholders. There are 75,657 innovative minds in the SOFWERX ecosystem that benefit from staying informed on what matters to the command.

If a Phase 2 SBIR is reached, there is a 25 percent or higher chance an idea will move on to Phase 3 production within a Special Operations Command program, in addition to the potential to transition to production through other federal or commercial transactions. Again, while that number may not seem high, it is among the highest in the Defense Department because of the direct participation of the command's program managers.

Another great bridge on offer are the Technology and Experimentation events, which are held several times a year and provide a relevant training environment with representatives from our operational community to provide feedback on prototypes. There is no guarantee of a production contract based on the event, but vendors will learn how well their prototype works in a special ops environment and what the operators think of it.

When applicants have a mature product, I highly encourage them to enter the relevant information into

vulcan-sof.com. Vulcan is an online repository of technology and product information that is accessible by many government employees from across not only the Defense Department, but other government agencies as well. Our program managers use Vulcan to conduct market research, support technology experimentation and evaluate capabilities against emerging needs. It is a useful tool to cross from product to scale.

Finally, the best and most reliable bridges are the operators themselves. A massive advantage for special operations acquisition is the experience of the end users. They are on average older than their service counterparts, competitively assessed and have years of training, education and operational deployments.

They provide great feedback to guide good technology across each of the valleys, but their most important contribution may come during the last valley — product to scale — because they will be the final arbiter of whether a product successfully completes operational testing and gets released for fielding.

In all cases, the acquisition efforts that I have seen that have never crossed this final valley are the ones that didn't have operator support from the beginning. The first time operators see a technology can't be during operational testing. We'll help get them involved early and often.

Planning is essential. I would encourage industry partners to always ask for the plan from their SOCOM counterpart — not just across the next valley but all the valleys.

I'll return to my Ranger School vignette to close out this point. On one patrol I remember, we arrived at the banks of a river we knew would be there and calmly passed the word back for the predesignated ranger student responsible for the rope to come forward. When he arrived, he didn't have the rope and explained that he had given it to another ranger student standing alongside the trail. Befuddled, we began to try to locate this mystery ranger.

Luckily, a short distance back the way we had traveled we found the rope neatly hanging from a tree branch that in the sleep-deprived, calorie-deficient mind of a ranger student might have resembled an outstretched human arm. We grabbed the rope, built the bridge and crossed the river. A good plan had saved poor execution. Plan for the valleys, and none of them will be fatal to the game-changing technology required by Special Operations Forces. ***ND***

James H. Smith is the acquisition executive, U.S. Special Operations Command.

Defense Dept. photo

ARMED OVERWATCH

AFSOC's New Recon Aircraft to Pack Big Punch

BY JAN TEGLER

When Special Operations Command selected L3Harris Technologies and Air Tractor Inc.'s AT-802U Sky Warden for its Armed Overwatch program last August, the command didn't have a formal designation for the rugged, versatile, single-engine airplane now known as the OA-1K.

But they did have a mission in mind.

They wanted one airplane that could "collapse the stack" of aircraft needed to perform irregular warfare missions in remote locales. Able to tackle the intelligence, surveillance and reconnaissance missions of the unarmed U-28A Draco and MC-12W Liberty aircraft it will replace, the OA-1K adds strike capability for close air support and precision strike missions with a gunship-like punch.

The contract award to L3Harris for as many as 75 of its modified turboprops could be worth up to $3 billion, according to the command. It's the culmination of an effort to field light attack/reconnaissance aircraft by the Air Force and Special Operations Forces that dates back to 2009.

Transformed into the "Armed Overwatch" program in 2020, it became a competition between six companies in 2021, reduced to three by spring 2022 with the OA-1K chosen on August 1, 2022.

Low initial rate production is already underway at L3Harris's Tulsa, Oklahoma, facility with three OA-1Ks being built, and a fourth aircraft — a modified version of the Air Tractor 802U the special ops airplane is based on — is in use for flight envelope expansion and handling qualities testing, according to the company.

Luke Savoie, L3Harris's president of ISR, said the OA-1K is "all about giving special operators options and flexibility in a package with a small logistical footprint." While it's not clear yet exactly what sensor and weapon combinations Air Force Special Operations Command will load the OA-1K with for different missions, L3Harris considered and modeled options that OA-1K aircrews could employ far away from fixed bases, Savoie said.

"How do you start to bring gunship level effects into austere, very hard to reach areas or areas that are becoming harder to reach because of basing availability or where the enemy has shifted?" he said. "How do you bring the magazine and persistence you need?"

BAE Systems' Advanced Precision Kill Weapon System, or APKWS, is one way to do that, Savoie said. Sky Warden tested and demonstrated APKWS on the AT-

Air Tractor photo

802U prototype used during Armed Overwatch program evaluations. The OA-1K can gain outsize effects with such an option, he noted.

That's because the APKWS kit that turns "easy-to-move" 2.75-inch rockets into precision-guided munitions can be assembled on-site and is common to other weapons like L3Harris's Vampire counter-UAS system. Savoie, a former U-28/AC-130 pilot, said the kit is desirable because of its precise, low collateral damage capability against hard and soft targets and because it can achieve proximity fuse-like effects.

"When we look at what gunships like the AC-130 do with their 105 mm cannon with a proximity fuse providing area-effect type of things against soft targets, APKWS essentially brings that same capability," he said. "It does that at a fraction of the cost of multiple shots or having to put guns on a platform to provide suppression or an area effect to break contact against soft targets."

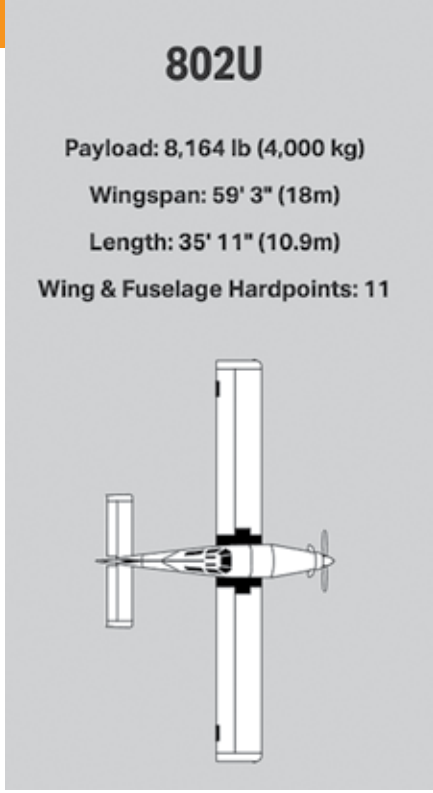
The aircraft can carry up to eight common launch tubes — nearly matching the 10 that the AC-130s feature — capable of launching AGM-176A Griffin laser/GPS-guided mini missiles, small glide munitions or air-launched effects, which gives the OA-1K a formidable magazine, Savoie added.

He compared it to AC-130 capability "where you're providing the same level of these magazines, the same level of persistence — we've demonstrated now close to 11 hours — and we can also do it with the sensors."

L3Harris designed OA-1K to use the company's MX-15 and MX-20 electro-optical/infrared medium and high-altitude imaging systems for ISR and laser targeting.

"Our standard configuration is an MX-15 and an MX-20. We've demonstrated the ability to carry two MX-20s, the same sensors that are on the AC-130," he said. "Now you're starting to get to the level of effects of a gunship in areas that are much harder to reach."

Many other types of precision-guided missiles and air launched effects were considered when designing OA-1K to give users like AFSOC and other potential customers a menu of munitions they can use and change over time, Savoie said. To further accommodate various weapons load-outs, L3Harris is performing external reinforcement of the AT-802U's wing that will enable production OA-1Ks to carry up to 6,000 pounds of ordnance.



The company has spent the last year modeling how many Harpoons — AGM-84 variants — and JASSM-ERs, or Joint Air-to-Surface Standoff Missile – Extended Range, could be carried on the aircraft. The assessments were done independently of Special Operations Command, he added.

L3Harris has done OA-1K captive-carry tests with AGM-114 Hellfire missiles and GBU-12 Paveway laser-guided bombs, and he noted that GBU-12s could be swapped for GPS-guided GBU-39 small diameter bombs or GBU-53 StormBreaker laser/GPS/millimeter-wave-radar-guided bombs.

"We designed the Sky Warden to take advantage of its flexibility," Savoie explained. "Some alternative platforms get very sensitive as to what you can hang out on the wings. The great thing about the 802U is that it has very little effect on the performance of the platform or maneuvering restrictions. The envelope does not shrink as you put stuff [on the wings]."

Minimizing the differences in the mission system and weapons OA-1K employs and those used by other special operations aircraft was also important. "We wanted mission system familiarity for aircrew," Savoie stressed. "We want even the ground crews to have familiarity" without requiring any special weapons training.

Given the capabilities of the sensors and weapons OA-1K can utilize, L3Harris sought to diminish the workload for its two-man aircrew. Savoie said the airplane's autopilot, fully integrated with its mission system, is the best example the company has ever designed.

"We have linkages into our mission system through it. So, I can be looking at something with the MX-20. The back-seater can hit a button on the window grip, or the pilot can hit it on the throttle or the stick and populate the system straight into the aircraft's Garmin 3000 integrated flight deck system," he said.

"The front-seater can hit a button and the autopilot will fly completely coupled orbits around a target, never having to shift over or do anything like that," he added. "You can transition from orbit center to over-center, mode-to-mode-to-mode completely seamlessly."

Savoie observed that when flying the U-28 or C-130, he was often the linkage between the planes' mission systems and their flight management systems. That required him to manually type information into their autopilots to fly orbits around targets.

"Now our visual sensors are completely linked in," he explained.

Wearing Thales' Scorpion Helmet, the same headgear A-10 pilots use, an OA-1K pilot "can actually look outside, see something, hit a button, drop a [GPS] point there and couple the autopilot around that point. It is now very much machine to machine, with the front-seater being able to confirm things versus having to sit there and type in coordinates. It dramatically reduces workload," he said.

The OA-1K was designed with the customer's preference to accommodate two 20-inch-class sensors in mind. Mounted underneath the aircraft's wings aft of its fixed main gear, the MX-15/MX-20 offer "unrestricted operations in the inside of orbits with no obstructions, blockages, etc. And both sensors can [laser] designate for a forward firing weapon or an orbit weapon," he said.

The ability to connect OA-1K with other aircraft, operations centers or ground forces to deliver video or metadata via line of sight and beyond-line-of-sight links was also a major consideration in its design, he added.

"We asked how we can make people not aboard the platform as smart as possible," Savoie said. "If a person in an operations center calls the airplane and says, 'Hey, we see movement on building 12. Please

Air Tractor graphic

confirm that no one's armed.' And the reply is, 'Yep, no one's armed.' That's one question and done because we're off-boarding the video, etc."

OA-1K's ability to "remote" its wing-mounted sensors to forces on the ground or in the air multiplies its utility. For example, when flying with three sensors, L3Harris recognized that one could be "latched to an ATAK user," he said. ATAK is an Android smartphone mapping, navigation and situational awareness app used by special operators.

"That sensor would follow that user everywhere they went," Savoie said. "So, if you were doing convoy escort, one of the sensors was always on the convoy. If you're part of that convoy and you want one of the sensors, you can control it, put it down on your map and move it around anywhere you want."

Information shared via OA-1K's digital backbone isn't limited to its own sensors. Link 16 connectivity allows the special operations airplane to ingest tracks from other aircraft or share its tracks with F-16s, for example.

F-16 pilots "can sit there with their Sniper pod and slew it to where the OA-1K's MX-20 is going and see what one of our pilots is looking at," Savoie noted.

Though it lacks ejection seats, OA-1K should protect its crew well in combat or from most impacts with the ground, Savoie said. The airplane's rugged armored construction is complimented by an integrated steel roll cage "stronger than what a NASCAR race car has" encasing its front/rear cockpits.

"This airplane is designed to be very survivable," he continued. "The original 802 is intended to operate at 20 feet off the ground predominantly. We're operating at much more hospitable and safe flight regimes with OA-1K."

Savoie summed up OA-1K as a platform designed with the potential to perform tasks most irregular warfare mission users might need. Intriguingly, he said L3Harris thought outside the box with OA-1K, mindful of the Agile Combat Employment concept that the Air Force is turning to for distributed operations from the Indo-Pacific to the Arctic.

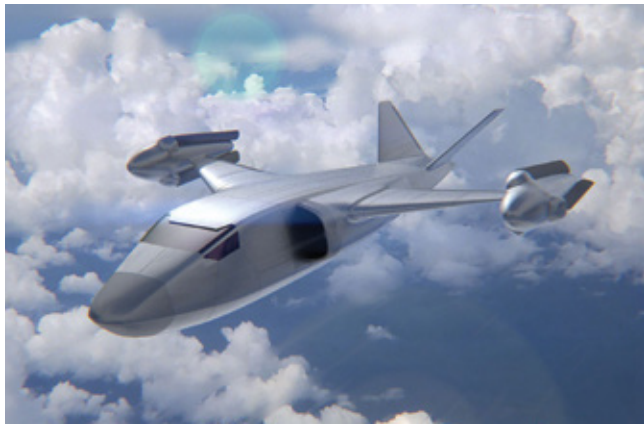
Though some might consider it unsuitable for operations against a peer foe like China, in contested airspace the OA-1K can operate at "altitudes and speeds where it becomes survivable again," Savoie said.

A command spokesperson said airframe tests will continue this year with verification of integrated mission systems functionality prior to operational testing in 2024. A formal training unit will stand up in the third quarter of fiscal year 2024, with the first operational OA-1K squadron forming in 2026 at a location yet to be determined. Full operational capability is expected in 2029, the spokesperson said. ***ND***

NEW AIRCRAFT

DARPA to Build New X-Plane for SOCOM

BY STEW MAGNUSON



DARPA concept

The Defense Advanced Research Projects Agency has kicked off a program to develop a runway-independent X-plane for Special Operations Command.

The Speed and Runway Independent Technologies, or SPRINT, X-plane demonstration project came to light in a March LinkedIn post.

The agency's Tactical Technology Office is soliciting proposals to design, build, certify and fly an X-plane to demonstrate speed and runway independence for a next generation of air mobility platforms, an agency statement said.

The artist's concept that accompanied the post portrayed an aircraft that looked much like the next-generation, autonomous hybrid-electric commuter aircraft that several companies are currently developing.

The broad agency announcement released March 9 stressed runway independence over other attributes. It did not mention whether the aircraft should be crewed, uncrewed or optionally piloted.

The announcement also did not mention whether it should use conventional or hybrid engines, only that it "must demonstrate the ability to generate and distribute power in all modes of flight and during transition between these modes of flight."

The announcement did, however, specify that the aircraft be scalable, have the ability to cruise at speeds from 400 to 450 knots, and at relevant altitudes between 15,000 and 30,000 feet. It should carry a payload of 5,000 pounds, with a substantial 30-foot-long, eight-foot-wide cargo bay capable of carrying a small vehicle or two and a half pallets, it said.

The initial requirement for endurance is one and a half hours and 200 nautical miles.

The announcement said runway independence was "envisioned as the ability to operate and hover near unprepared surfaces, such as sections of damaged runways, remote highways/roadways, unprepared fields with dry grass, parking lots, etc."

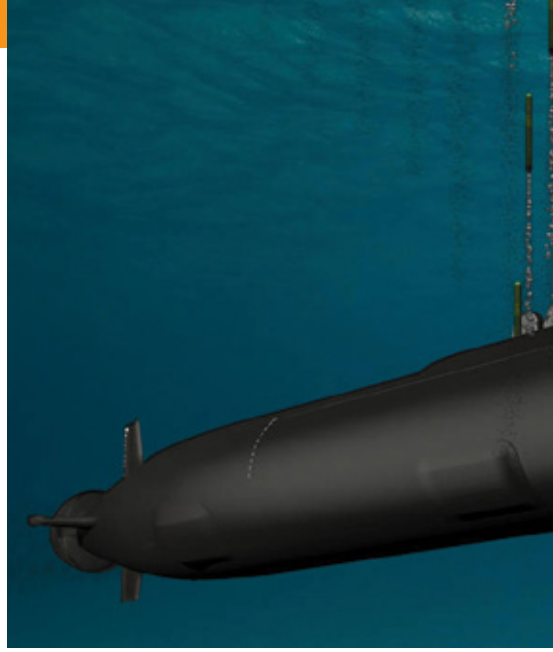
It will be a three-phase project, with the first phase seeking proposals. The entities selected will share $15 million to refine their concepts. The second part includes a downselect with $75 million of total funding for risk reduction work and air certification approvals, then a further downselect to build and fly the aircraft. That amount was undisclosed.

"The goal of SPRINT is to reach first flight of the demonstrator no more than 42 months from contract award," the announcement said. ***ND***

UNDERSEA WARFARE

New Virginia-Class Subs Built to Accommodate SEAL Teams

BY JOSH LUCKENBAUGH



The Navy is augmenting its attack submarine fleet with a new payload module that could expand its ability to support special operations missions.

In December, senior Navy leaders, elected officials and industry representatives gathered at General Dynamics Electric Boat's Quonset Point Facility in North Kingstown, Rhode Island, for the keel-laying ceremony for the USS Arizona, the 30th of the service's Virginia-class fast attack submarines.

Once completed, the Arizona will be the first in its class to be equipped with the Virginia Payload Module, a new hull section that will enable the Arizona and subsequent Virginia-class ships to deliver a variety of capabilities such as special operations equipment or vehicles, weapons and undersea payloads, according to the Navy.

"The boats in this class are the most advanced attack submarines ever designed. Their stealth, firepower and maneuverability are superior to every other attack submarine force in the world," Rear Adm. Jonathan Rucker, the Navy's program executive officer for attack submarines, said in a press release. "Building, operating and maintaining Arizona and other Virginia-class subs is crucial to ensuring the Navy's ability to project power in an ever-shifting global threat environment, and to maintaining peace and the free operation of our sea lanes."

The first ship in the class, the USS Virginia, was commissioned in 2004. The first 10 Virginia-class subs — Block 1 and Block 2 of the class — feature 12 Vertical Launch System tubes for firing Tomahawk cruise missiles, a Navy fact file on attack submarines said.

Beginning with Block 3, the Navy redesigned "approximately 20 percent of the ship" to reduce acquisition costs, the fact file said. The redesign included replacing the 12 vertical launch tubes with "two large diameter 87-inch Virginia Payload Tubes," the file said. The added volume of the tubes provides more payload flexibility while simplifying construction and reducing acquisition costs, the file stated.

The Navy maintained this design on the Block 4 ships, but starting with the Arizona — the second sub in Block 5 — the Navy introduced the Virginia Payload Module, or VPM, featuring four additional large diameter payload tubes, the fact file said.

The module "reconstitutes the ability" of the Virginia class to hold dry deck shelters that can launch and recover SEAL, or sea, air and land, teams "and allows the Navy to host additional advanced payloads via multiple ocean interfaces," the Navy file said.

The module could prove quite useful for supporting special operations forces, said Bryan Clark, a senior fellow and director of the Center for Defense Concepts and Technology at the Hudson Institute.

"The Virginia class has lock-in, lock-out chambers, and it's got the ability to carry the dry deck shelter that the swimmer delivery vehicle lives in," Clark said. "The Block 5's will have the ability to carry additional vehicles."

Instead of missiles, SEALs could store vehicles or gear in the tubes and retrieve this "specialized equipment" when the mission begins, he said.

The module is 84 feet long — bringing the total length of the Virginia-class subs up from 377 feet to 461 feet, the Navy file said — and can store and launch "payloads with diameters larger than the 21-inch diameter of a torpedo or Tomahawk missile," a December Congressional Research Service report on Virginia-class sub procurement said. Block 6 of the Virginia class is expected to include the VPM as well, a Navy spokesperson said in an email.

General Dynamics Electric Boat — the prime contractor for the Virginia class — awarded contracts in 2016 to BAE Systems and BWX Technologies for the production of the launch tubes, with BAE Systems winning additional production contracts in 2018 and 2019, per company press releases.

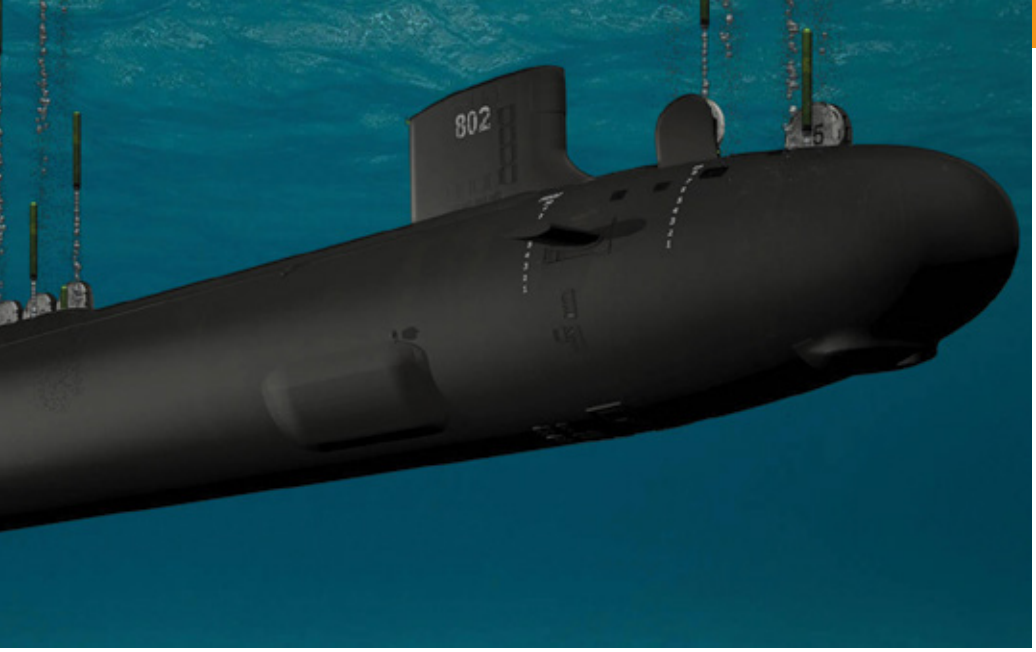
Compared to previous Virginia-class subs, those featuring the VPM will require larger crews "in the weapons department to be able to manage the missile tubes," Clark said. The increase in size and weight due to the module will likely lead to maneuverability concerns as well, he added.

The Navy "has performed extensive analysis of the impact of" the VPM on the Virginia-class subs, the Navy spokesperson said. "The expanded volume allowed for additional margin" for systems such as hydraulics and cooling, "with modest impacts to maneuvering and speed," the spokesperson said.

"In terms of ship handling, the Navy expects that this will be, more or less, not a big difference from the Virginia class as it currently exists," Clark said. "But I think everybody who's a submariner anticipates that the ship will handle a lot differently. It'll be heavier, it will probably be slower ... so there is a concern that potentially these Block 5 and then Block 6 submarines may have more limited operations envelopes, if you will, compared to the previous blocks of Virginia."

The Virginia-class subs with the Virginia Payload Module will likely be used more for patrolling or special operations support missions as opposed to "traditional submarine missions" such as gathering intelligence in contested waters, Clark said.

In terms of missile capacity, "each VPM payload tube is capable of carry-



Defense Dept. illustration

ing seven Tomahawk cruise missiles adding 28 missiles per" module, the Navy file said. The additional firepower provided by the module "is intended to compensate for a sharp loss in submarine force weapon-carrying capacity that will occur with the retirement in FY2026-FY2028 of the Navy's four Ohio-class" guided missile submarines, or SSGNs, the Congressional Research Service report said. The Ohio class also includes 14 ballistic missile submarines, or SSBNs, which the Navy will replace with its Columbia-class boats.

Each of the Ohio-class SSGNs — which are 560 feet long, according to a Navy fact file — can carry 154 Tomahawk missiles, "so you'd end up with about four Virginia class Block 5's being equivalent to one [Ohio class]," Clark said.

"The idea was ... build 10 Block 5 and then 10 Block 6 Virginia class so that will give us 20 submarines with 40 additional missile tubes, and that will compensate for that loss of missile capacity," he added.

However, due to construction delays on Block 4 and Block 5 Virginia-class subs, there will be a gap between the retirement of the Ohio-class SSGNs and the commissioning of the Virginia-class subs that have the module, Clark said.

Media reports in the spring of 2019 indicated that the two contractors in charge of Virginia-class submarine construction — General Dynamics Electric Boat and Huntington Ingalls Industries — "were experiencing challenges in meeting scheduled delivery times as the Virginia-class program was transitioning from production of two 'regular' Virginia-class boats per year to two VPM-equipped boats per year," the Congressional Research Service report detailed. On the company's quarterly earnings call in February 2022, Huntington Ingalls Industries' then-COO and current president and CEO Chris Kastner confirmed the company had missed submarine milestones for two Block 4 Virginia-class subs at the end of 2021.

Due to these delays, the Navy will be left "without ... an equivalent undersea missile capacity" to the Ohio-class subs for a time, Clark said. A Department of the Navy Special Acquisition Report from December 2021 projected a November 2028 delivery date for the USS Arizona.

"There's a learning curve, but they will get more efficient at building them after they've built a few," he said. "Both shipbuilders have built a lot of additional infrastructure to support construction of Columbia and the Block 5 Virginia class, [and] that infrastructure is now being brought into the production process."

Along with special operations equipment and missiles, the VPM could also deliver unmanned underwater vehicles, a Navy press release said. While the service does have and use these vehicles primarily for mine hunting — and could use them in the future for "undersea warfare" missions — deploying them from the new modules could prove a challenge, Clark said.

"The tubes open on the top of the submarine, so if you have undersea vehicles you want to deploy ... they're going to have to swim out the top, which is not preferred," he said. "You prefer them to be able to swim out horizontally."

As of now, "there are no planned unmanned vehicles being launched from the Virginia Payload Module itself, however submarines are planned to incorporate a torpedo tube launched variant of the Razorback Unmanned Underwater Vehicle as well as Submarine Launched Unmanned Aerial System," the Navy spokesperson said.

The Navy is more likely to "use these tubes to carry a variety of missiles," Clark said, "because you can deploy unmanned vehicles from lots of other places, whereas you can only deploy weapons from certain missile cells and containers."

Along with Tomahawk missiles, the Navy is interested in deploying hypersonic weapons — systems that can reach Mach 5 or higher, or at least five times the speed of sound — from the module once these capabilities are developed, he said.

Hypersonic weapons have become a top priority for the Defense Department. The Navy is currently working on a hypersonic weapon program called Conventional Prompt Strike, while the Army is developing the Long Range Hypersonic Weapon.

The two services conducted a test of their hypersonic capabilities in October. Both programs "are on track to support the first fielding of a hypersonic capability to the Army in [fiscal year] 2023," a Navy press release said.

Hypersonic weapons are certainly "something that the Navy and Congress and DoD want to try to integrate onto the Virginia class, because I think they see that as the best platform to have a mobile way to deploy that weapon in theater" without having to be "dependent upon host nation support," Clark said.

While the Navy brought up the potential of using the VPM to carry unique systems such as unmanned underwater vehicles, the service is likely to prioritize carrying special operations equipment or missiles such as Tomahawks or hypersonics in the module, Clark said.

"I think what they're finding in practice is that it costs a lot of money to put something into a payload module like that, and then we have to probably make some choices," he said.

"Certain payloads end up being most advantageous, and other payloads are nice to have or interesting, but maybe are more experimental and not likely to be the production equipment that we actually put on the ship." ***ND***

AMMUNITION

Special Ops Ammo Spreads to Other Services

BY SCOTT GOURLEY

After nearly a decade of being fired by U.S. special operators, polymer-cased ammunition is moving into several new calibers and being adapted by other services.

Polymer-cased ammunition replaces the traditional brass cartridge case with a plastic material. Its advantages include significantly lighter weights and greater performance consistency.

Widely fielded on an international basis, recent U.S. military polymer ammunition examples range from True Velocity's participation on the LoneStar Future Weapons team during the Army's 6.8 mm Next Generation Squad Weapons competition to multiple designs for a new .338 Norma Magnum medium machine gun for Marine Corps and Special Operations Forces use.

One of the earliest special ops applications involved its use on Special Operations Command's AH-6 "Little Bird" helicopters. Joe Gibbons, manager of government programs for Nammo MAC LLC, said that about six years ago the company's .50 caliber polymer ammunition design eliminated the weight tradeoff between fuel and ammunition, allowing the helicopter the ability to carry more fuel at full ammunition loads and spend longer time on station.

The .50 caliber applications are "very close" to expanding into broader use by the Marine Corps, he said. The company has been qualifying the polymer .50 caliber ammo with the service so they can receive a fully approved, or "catalogued," round.

The Marines are also conducting limited user evaluations at Camp Lejeune, North Carolina, by different units and at Camp Pendleton, California, where they are currently doing demonstrations with the light armored vehicle group, he said.

MAC .50 Cal (12.7 mm) Polymer Ammunition

Early reliability testing at Naval Surface Warfare Center Crane Division earlier this year should pave the way to catalogue the round by this fall, he said.

As for other missions, Gibbons said, "We believe — although we don't know for a fact — that some of our polymer ammunition has made it from some of the people that we've supplied polymer ammunition to in Europe into Ukraine, partially because I have an inquiry for polymer-cased ammunition to go to Ukraine. And that's about all I can say about that."

In addition to the expanded applications for the .50 caliber rounds, Gibbons said that the company is working on both .338 Norma Magnum and 7.62 mm NATO polymer designs.

Acknowledging that the .338 Norma activities focus largely on the emerging SOCOM/USMC medium machine gun requirement, he said, "We've been working with all the gun manufacturers. We're agnostic. We don't care. But until SOF and the Marine Corps — primarily SOF — decides on what platform they're going to go with, we can't do any fine tuning until we actually get the gun."

As for the 7.62, he added, "We have a lot of interest from SOCOM on developing the round for the 7.62 mm minigun. And it's for the same reason as for the 'fifty' — taking the weight out of the helicopter."

In addition to conducting any necessary "fine tuning" of the cartridges for a particular weapon, the company is "always" doing internal technology work on the case itself, Gibbons said. Asked for an example, he stated, "The Marine Corps set the [polymer] operating temperature at minus 25 degrees Fahrenheit. That's a little bit warmer than the brass, which is minus 65. And we're working to make those improvements to get all the way to minus 65. Whether we can or not remains to be seen. It's a pretty tough challenge for polymer to work in very hot and very cold conditions."

Expanding on his characterization of an "agnostic" design for the .338 Norma Magnum, Gibbons emphasized the need for ongoing coordination between ammunition and gun manufacturers, noting, "There's a reluctance by some gun manufacturers to make the minor changes that would be necessary to accommodate a polymer case and still run with a brass case."

He compared the current environment to what he called "the John Browning days," when a projectile was developed around a target; a complete round developed around that projectile; and a gun or chamber developed to take that round.

"In our world we have to fit the existing gun," he said. "Even when they have a new gun that never existed, some manufacturers are not willing to make even minor changes. I think sooner or later some people will come around.

"I keep asking them, do you really want a lightweight cartridge or not? Do you want it to work or not?" he said. "We know that we can make this little change and brass will still run and plastic will run a lot better. They'll come around. It's just slow."

As for upcoming activities over the next six months, Gibbons highlighted the current work surrounding the .50 caliber polymer cartridges, observing, "We're not really sure what's going to happen once we get a catalogued round, but that should open up our ammunition to a lot of users that are not special operators." ***ND***

Nammo MAC photo

PERSONAL DEFENSE WEAPON

Commandos To Receive Upgraded Assault Rifles

BY SCOTT GOURLEY

LEFT: Sig Sauer MCX Rattler

BELOW: 7.62x39 mm caliber ammunition

U.S. Special Operations Command is already looking to expand the capabilities of its Reduced Signature Assault Rifle — formerly known as the Personal Defense Weapon — before its manufacturer has even delivered the first weapon in the program.

The command is considering the addition of conversion kit options to incorporate 7.62x39 mm caliber ammunition, which is most used in the AK-47 series assault rifle, a "notice of intent" released late January stated.

The original program emerged in March 2017, when the command released an announcement seeking to identify "potential sources within the national technology and industrial base with the ability to provide a conversion kit for the 5.56 mm M4A1 to create a Personal Defense Weapon system."

Kit requirements included conversion to fire the .300 Blackout cartridge, a system weight not to exceed 5.5 pounds, extended length not to extend 26 inches and length with stock collapsed or folded to be 17 inches, with the weapon fully functional when collapsed or folded. The kits also needed to include a 5.56 mm barrel that allowed the weapon to be changed from .300 Blackout to 5.56 mm in less than three minutes.

The .300 Blackout provides several tactical differences when compared to the 5.56 mm. First, while most 5.56 mm operational projectiles fall within the general range of 55 to 77 grains, the .300 projectile falls within the general range of 110 to 120 grains. At a comparable velocity, that translates to more energy on target.

Additionally, on the subsonic side, the .300 Blackout provides a fully suppressible cartridge that is not available in 5.56 mm. Many gun and ammunition manufacturers believe that the combination of increased performance in the supersonic range and subsonic capabilities combined to "popularize" the .300 Blackout for many special operators, with potential benefits from the 5.56 mm conversion kit ranging from the availability of training ammunition to addressing possible "shoot house" restrictions.

Meanwhile, Special Operations Command elements continued to explore optimized barrel lengths and barrel twist rates for the .300 Blackout in a potential short-barrel carbine configuration.

Sig Sauer responded to the 2017 Personal Defense Weapon program with a version of its MCX "Rattler." The command subsequently acquired approximately 340 of the guns with 5.5-inch barrels in .300 Blackout, with the ability to convert the guns back to 5.56 mm, according to Jason St. John, senior director of government products at Sig Sauer.

In May 2022, Special Operations Command announced its intent to award the Personal Defense Weapon contract to Sig Sauer, acknowledging in a statement that "after years of continuous market research," headquarters had concluded that Sig Sauer was the only vendor that could fulfill the need for the commercial Personal Defense Weapon requirement.

"We have meticulously reviewed each system for technical acceptance and whether it fits the commercial definition. Except for Sig Sauer, the vendors did not meet the technical requirements and/or the weapons do not meet the commercial definition," it said.

The contract award in late September identified the program's new name — the Reduced Signature Assault Rifle. It cited a five-year indefinite delivery/indefinite quantity contract to provide a complete weapon system — Sig Sauer Rattlers in 5.56 mm and .300 Blackout caliber — that includes suppressors, cleaning kits, magazines, quick barrel change kits, force on force training kits and other accessories.

Approximately 800 guns will be acquired under the Reduced Signature Assault Rifle program, which features a slightly enhanced version of the Rattler platform in .300 Blackout — convertible to 5.56 mm — with a seven-and-three-quarters-inch barrel.

St. John noted that the company had not started deliveries as of late February but anticipated that the order would be completed "this year."

But before deliveries even began, the January notice of intent cited "developing requirements" that called for "7.62x39 mm upper receiver caliber conversion kits that are compatible with the Sig Sauer Rattler lower receiver."

"That's the beauty of the MCX design," St. John said. "The MCX has a self-contained barrel clamp and the ability to rapidly change calibers through our 'CAL-X' exchange kits for MCX platform."

The modularity of the Rattler in general has everything from the six-and-three-quarter-inch .300 Blackout barrel through nine-, 11-, 14- and 16-inch options, he said. And there are variations throughout different calibers, he noted. And the modular design allows Special Operations Command to buy just one firearm in .300 Blackout and then just a 7.62x39 mm kit to convert it, he noted.

In addition to the 7.62x39 mm seven-and-three-quarter-inch barrel and new bolt, the conversion will also require an AK-style "curved magazine" to address the taper of that round, he said. ***ND***

Sig Sauer photo, iStock photo

TACTICAL VEHICLES

SOCOM Lays Out Shopping List For Key Vehicle Upgrades

BY JOSH LUCKENBAUGH

COLUMBUS, Ohio — U.S. Special Operations Command is shifting its focus from counter-terrorism operations to near-peer competition, and it needs help from industry to ensure its land vehicles have the right capabilities for future missions, a service official said.

Over the last two decades, special operators have "pretty much mastered" missions in the U.S. Central Command area of responsibility, which includes the Middle East and parts of Northeast Africa and Central and South Asia, said Marine Corps Lt. Col. Alfredo Romero, the program manager for the Family of Special Operations Vehicles at Special Operations Command.

However, as SOCOM — and the Defense Department as a whole — advances its concept of integrated deterrence for a potential great power conflict, preparing for a fight against an adversary with "equally matched capability" presents a "very complex problem," Romero said at the National Defense Industrial Association's Tactical Wheeled Vehicles Conference.

"How do we master all domains?" he said. "How do we operate in that denied, non-permissive, nation-state-developed type of [environment]? ... We're really going to focus on the ground mobility aspect of this problem set."

As they look ahead to the future battlefield, one particular issue Romero and his team are "taking a hard look at" is the balance between "kinetic versus non-kinetic survivability" capabilities on their tactical vehicles, he said.

"Are we going to be worried more about threats from the sky? Or are we going to be worried [about] threats from the ground, like improvised explosive devices?" he said. "I don't know. Intel is going to have to tell us that."

Romero acknowledged that facing a near-peer competitor that possesses advanced capabilities such as electronic warfare, cyber and high-energy weapons is "a space that we're not very familiar with, and probably need more fidelity on ... anything beyond traditional projectiles.

"This is a constant problem, and the enemy and the battlefield are always [evolving]," he continued. Special operators must be "open-minded" as they look for solutions to these survivability questions, he said.

"How do I not be seen? ... How can I not be targeted? How can I not be hit? How can I not be penetrated, and how can I not be killed?" he said. "So, those are those things that we're looking at — ways to protect the warfighter. And that's where I think we need help from industry, is both in kinetic and non-kinetic possibilities."

In particular, SOCOM is looking to industry for technology solutions for cyber hardening, signature management and lightweight armor, Romero said. "We're always looking to lighten the load on the vehicles," he said about lightweight armor.

Another focus area for special operations vehicles is hybrid/electric capabilities. One of the vehicles "in concept" at SOCOM is a hybrid-electric version of the Ground Mobility Vehicle 1.1, Romero said. The command has "two prototypes that are in the final install right now," after which they will undergo safety testing, he said.

"This is kind of an interesting problem set because ... what are the tradeoffs that you get with batteries?" he said. "What do I lose with this technology, how much payload do I lose? What do I gain?

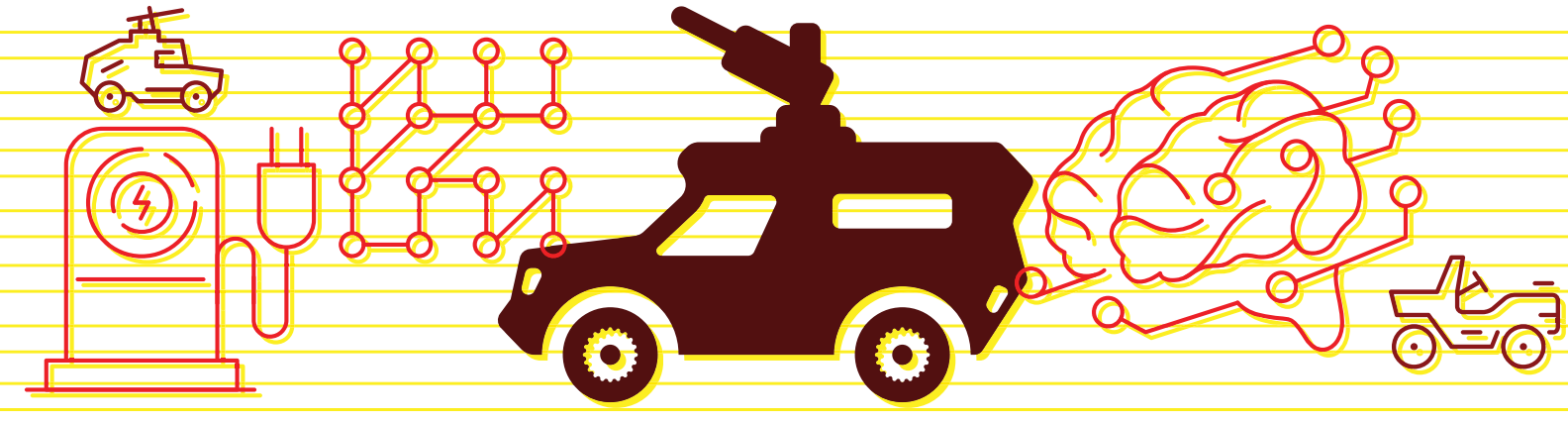
"That's why we're building these tech demonstrators, to help inform ... requirements for the user community," he added.

Other items on the SOCOM shopping list include autonomous or semi-autonomous vehicle capabilities that can reduce "cognitive load on the operator" and modular mission kits that are vehicle agnostic, Romero said.

"Anything that I can bolt on or bolt off rapidly [and] give the operator kind of a menu of items" such as tire racks or traction mats for snow, he said regarding the modular mission kits. SOCOM is also seeking modular command, control, communications and computers, or C4, kits, he added.

"C4 is relatively expensive, so how do we find a kit that's kind of a one size fits all?" he said. "There's definitely some area for growth ... for that space."

As for purchasing vehicles themselves, "I don't think that SOCOM in the near term will be buying a SOF-unique vehicle platform," but rather will utilize vehicles provided by the services and then "enhance and provide SOF-unique modifications," Romero said. "That's going to be the wave of the future." ***ND***



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MARITIME TECHNOLOGY

Navy SEALs Seek New Tech for Covert Missions

BY STEW MAGNUSON

TAMPA, Florida — Whether it is in super-fast and stealthy boats, mini-submarines or combat diving suits, Special Operations Command's elite maritime forces — better known as SEALs — are on the lookout for technologies that make their jobs easier.

"We're predominantly focused on access for maritime mobility, getting into denied areas other people can't go — other countries can't go. We provide the means and the methods for insertion," Navy Capt. Randy Slaff, program executive officer for maritime systems at Special Operations Command, said at the May SOF Week conference.

The good news to come out of the conference was that SEALs would soon receive the long-awaited Dry Combat Submersible, a mini-sub built by Lockheed Martin that can remain underwater for 24 hours, has a range of 60 miles and can travel at depths of 330 feet.

Naval special operators needing to travel undersea must currently don wet suits and use the SEAL Delivery Vehicle MK 11. The dry submersible — which can transport eight SEALs, plus two crew members — is expected to give them more time underwater because they are not exposed to the cold.

The concept for a dry submersible dates back to the early 1980s with a contract awarded to Northrop Grumman to build six of the Advanced SEAL Delivery Systems in 1994. After years of delays due to technical issues, the Navy canceled the program in 2009 after spending some $883 million. The current iteration was the Navy's third attempt at developing a dry submersible for SOCOM.

Also helping keep SEALs dry — at least until they arrive at their destination — is the Dry Deck Shelter, which attaches to Virginia-class attack submarines. SEALs use the shelter to don their wetsuits and leave and return via a lockout system.

"We're starting to look at what the next one looks like and how are we going to get after replacing them, because they can't last forever," Slaff said.

The command is currently studying the requirements for the Dry Deck Shelter Next, which will be affixed to the top of the new models of the Virginia-class submarines.

The program is seeking a new shelter capable of dispersing up to 18 swimmers and their equipment, as well as unmanned underwater or surface vehicles, according to slides.

It should also support "dry" missions, suggesting that it connect to the new dry submersible.

Like the Dry Combat Submersible, the Navy will develop the new shelter on behalf of SOCOM, which is currently working through the requirements.

Once SEALs are in the water, they rely on combat diving equipment to do their jobs. Most of that comes from the commercial or recreational diving world, said Jim Knutson, combat diving program manager. It takes off-the-shelf equipment and modifies it for special ops use, he said.

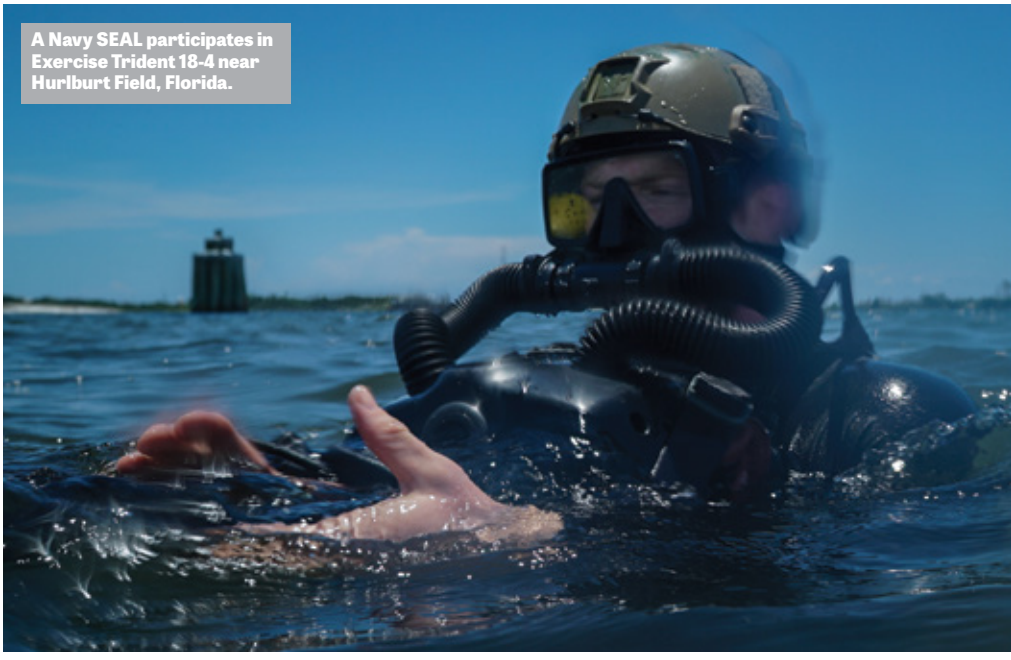
One area where divers need industry help is underwater communication when SEALs use mixed gases to extend their time underwater. They need to speak "clearly with each other so they're not talking like Mickey Mouse," Knutson said.

As for the small, speedy surface boats that deliver SEALs to their missions such as the Combatant Craft Assault and the medium and heavy models, the fleet is mostly built out with boats now entering the sustainment part of their lifecycle, Slaff said.

However, the command is starting to look at "what comes next and how do we want to keep going on the craft and have some evolutionary upgrades."

Conrad Lovell, next-generation mobility team lead under the command's Science and Technology Office, said his program is interested in new ways to make the watercraft stealthier. That includes reducing their acoustic, visual and thermal signatures as well as high-tech coatings, composites and metamaterials that can help them evade radar.

Slaff said his office is always on the lookout for new technology that can assist naval special warfare. "When you have ... some new whiz bang technology that we could use downrange, we definitely want to hear about that. If it's something about reliability, maintainability, sustainability, we want to hear about that, too. The whole spectrum is ours." ***ND***



A Navy SEAL participates in Exercise Trident 18-4 near Hurlburt Field, Florida.

Air Force photo

COMMENTARY

Special Operators Require Next-Gen Technologies

BY JENNIFER STEWART

U.S. Special Operations Forces operate in an environment of global competition in which strategic adversaries have a refined and calibrated understanding of the threshold that would trigger the nation to take decisive military action. At the operational level of warfare, the United States benchmarks authorities, activities and capabilities to phasing constructs for operational plans.

Adversaries are not limited by the same construct. Daily, adversaries leverage information operations, cyber and space capabilities, unconventional operations and other elements of national power while avoiding the costs and consequences of escalation.

To prevail in this competition, the 2022 National Defense Strategy prioritizes integrated deterrence to recalibrate U.S. adversaries' risk calculations. In addition, the Joint Chiefs of Staff's recently released "Joint Concept for Competing" emphasizes the need at the strategic level of warfare for the Joint Force to re-posture from reactive operational responses to proactive strategic actions that favor U.S. long-term interests or undermine an adversary's efforts to pursue their incompatible interests.

In this context, the Office of the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict and U.S. Special Operations Command are focused on adjustments to optimize SOF's role in integrated deterrence and campaigning against strategic adversaries. The United States sends these highly trained, highly disciplined men and women into the most complex and dangerous locations around the world to build partnerships, provide unique access and placement to maximize response options for senior leaders and create dilemmas for competitors and adversaries.

In addition, the National Defense Strategy is also a reflection of the Defense Department's assessment that the future character of war is being shaped by advancements in information operations, cyber activities, space operations and ballistic missile technology. Conflict is expected to spread quickly across the boundaries of geographic combatant commands, increasing the likelihood that it will be transregional, multi-domain and multi-functional.

Therefore, the functional combatant commands — in particular special operations, cyber and space — are working together to leverage their unique global reach, persistence, endurance and responsiveness. SOF often require cyber and space capabilities to sense, understand and visualize their operational environment or to conduct kinetic operations. Other commands, in turn, rely on their physical access and placement to deliver effects. The objective is to achieve desired effects in the operational domains faster than any adversary.

The national strategies, concept development and analysis of the future character of war are also driving the command's fiscal year 2024 science-and-technology integrated priority list. The command is focused

on "SOF-unique" and "operationally relevant" next-generation technologies for special communications, electronic warfare systems, tailored lethality, human performance optimization and data-enabled personnel.

SOF will need next-generation technical solutions to continue to operate in hostile, denied or politically sensitive environments. They require resilient, survivable and federated networks that are enabled by timely, actionable and mission-assured dissemination of data. They will also need use of indigenous communications; robust encryption methodologies and devices; low probability of intercept or detection with specific solutions for contested area data management; and multi-purpose wireless devices.

With the emphasis on contested and denied operating environments, the command is also focused on electronic warfare systems to collect and identify threat signatures and to create effects to disable or destroy anti-access/area denial targets to enable freedom of maneuver for U.S. forces, with a particular focus on littoral and maritime domains.

Its personnel are also expected to operate in dispersed small units, requiring enhancements to current precision effects and combat lethality capabilities. This will require data networking enhancements to improve the transport of targeting data; precision-guided munitions; next generation intelligence, surveillance and reconnaissance support technologies to operate effectively in contested and non-permissive environments; and methods to secure access to buildings, facilities and structures, either remotely or with lower risk to personnel.

True to the SOF value of taking care of its people, the community is focused on improving and increasing their physical and cognitive abilities, including exploring new approaches to achieve the restorative effects of sleep; providing greater mental acuity; developing minimally invasive, alternative or internally powered diagnostic devices to provide actional information on predictors of injury; and identifying technologies to maximize physical performance, including increased endurance and greater tolerance for extreme temperatures and changes in altitude.

Finally, SOF is focused on artificial intelligence, machine learning and edge computing to enable data accessibility, advanced processing and analysis and dissemination of data in contested and disconnected operating environments. The desired end state is to access and quickly process critical data to enhance flexible autonomy, reduce cognitive loading and support timely and actionable insight to inform tactical decision-making.

Ultimately, SOF will need man-portable edge computing solutions to process data from multiple sources and sensors with minimal hardware footprints and power consumption levels, as well as data fusion techniques to interconnect and enrich disparate data streams and dynamic data management. The technical solutions must prioritize movement of data within hybrid cloud, network-connected and network-disconnected environments.

While SOF comprises less than 3 percent of the Joint Force, it accounted for almost 50 percent of deployed U.S. military personnel in the last fiscal year. This reflects the reality that there is no other element of the Joint Force as purposefully designed, trained and employed to shift the center of gravity in preventing conflict in favor of the United States.

The return of great power competition reminds policymakers and the U.S. public of the roots, the core competencies and the value proposition of the entire SOF community. The demand signal will only increase, and their operating environment will become more complex, which is why these next-generation science-and-technology solutions are so essential. ***ND***

Jennifer Stewart is NDIA's executive vice president of strategy and policy.

Defense Dept. photo