

American Submariners Inc.
4370 Twain Ave.
San Diego, CA 92120-3404



The Silent Sentinel July 2018



Our Creed and Purpose

To perpetuate the memory of our shipmates who gave their lives in the pursuit of their duties while serving their country. That their dedication, deeds, and supreme sacrifice be a constant source of motivation toward greater accomplishments. Pledge loyalty and patriotism to the United States of America and its Constitution.

In addition to perpetuating the memory of departed shipmates, we shall provide a way for all Submariners to gather for the mutual benefit and enjoyment. Our common heritage as Submariners shall be Strengthened by camaraderie. We support a strong U.S. Submarine Force.

The organization will engage in various projects and deeds that will bring about the perpetual remembrance of those shipmates who have given the supreme sacrifice. The organization will also endeavor to educate all third parties it comes in contact with about the services our submarine brothers performed and how their sacrifices made possible the freedom and lifestyle we enjoy today.



Submarine Veterans Celebrate Independence Day in Julian, CA

U.S. Submarine Veterans San Diego Base

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The Silent Sentinel via Email

To all of my Shipmates and families who currently receive our Great newsletter via the mail who would like it sent via email or continue to receive it via mail, please fill out the form and mail it to the base or myself. We are trying to cut the cost of the newsletter down from \$3700 to about \$1900 a year. By receiving the Silent Sentinel via email will cut down the printing and mailing cost. The other plus to receiving it via email is you can save it on your computer and not have the paper lying around the house.

A subscription to the Silent Sentinel newsletter will be available to surviving family members via internet email, at no charge, upon notification of the Membership Chairman. If a printed hard-copy is preferred, via US Post Office delivery, an annual donation of \$5.00 will be requested to cover costs.

NAME: _____

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Would like the SILENT SENTINEL emailed: YES _____ NO _____

USSVI Base Commander
c/o VFW Post 3787
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San Diego, CA 92120-3404

DUE TO LOGISTICS CONSTRAINTS, ALL INPUTS FOR THE SILENT SENTINEL MUST BE IN MY HAND NO LATER THAN ONE WEEK AFTER THE MONTHLY MEETING. IF I DO NOT RECEIVE IT BY THIS TIME, THE ITEM WILL NOT GET IN. NO EXCEPTIONS! MIKE

July 2018 Meeting

Our monthly meeting is held on the second Tuesday of the month at VFW Post 3787, 4370 Twain Ave., San Diego. Our next meeting will be on *July 10th*. The post is located one-half block West of Mission Gorge Road, just north of I-8. The meeting begins at 7 p.m. The E-Board meets one hour earlier at 6 p.m.

*Check us out on the World Wide Web
www.ussvisandiego.org*

*Binnacle List
Frank Workman*

Submarine Losses in July Originally Compiled by C J Glassford



USS S-28 (SS-133)

Lost on July 4, 1944 with the loss of 49 crew members. She was conducting training exercises off Hawaii with the US Coast Guard Cutter Reliance. After S-28 dove for a practice torpedo approach, Reliance lost contact. No distress signal or explosion was heard. Two days later, an oil slick was found near where S-28. The exact cause of her loss remains a mystery.

USS Robalo (SS-273)

Lost on July 26, 1944 with the loss of 81 crew members while on her 3rd war patrol. She struck a mine about 2 miles off the coast of Palawan. Four men survived and swam ashore, then were imprisoned by the Japanese. Unfortunately, they were put on a Japanese destroyer and lost when that destroyer was sunk.

USS Grunion (SS-216)

Lost on July 30, 1942 with the loss of 70 crew members while on her first war patrol near Kiska Harbor. She radioed that she sank two sub-chasers and damaged a third, but was never heard from again. Grunion's mangled remains were found in the Bering Sea in 2006 off the Aleutian Island of Kiska.



San Diego Base, United States Submarine Veterans Inc.
Minutes of Meeting - 12 June 2018
At VFW Hall, 4370 Twain Avenue, San Diego CA 92120

1905 - Base Commander Warren Branges called the meeting to order.

Conducted Opening Exercises - Pledge of Allegiance lead by Chief of the Boat Bob Bissonnette

Chief of the Boat Bob Bissonnette lead the opening prayer.

Chief of the Boat Bob Bissonnette conducted Tolling of the Boats for boats lost in the month of June.

Base Secretary Jack Kane recognized Past Commanders, dignitaries and guests.

Base Secretary Jack Kane announced 22 members and 2 Guests present.

Base Treasurer Joe Peluso presented the Treasurer's report. A copy of the Report will be filed with these minutes.

Minutes of the April and May meetings were published in the Sentinel. These minutes will be published in the Sentinel.

Base Commander Warren Branges called for Committee Reports

Binnacle List - Base Commander Warren Branges reported Frank Workman on Binnacle.

Parade Committee - Base Commander for Joel Eikam. Next Parade is Julian on 4th of July.

Membership Committee - Chairman Ray Febrache. We have currently have 249 base members.

Scholarship Committee - Committee Chairman Paul Hitchcock - Chairman has received four applications for scholarships. The Committee is reviewing these applications. The Committee recommends we present all 4 applicants a \$500 scholarship.

Storekeeper - Paul Hitchcock - Base Commander and Storekeeper are still doing a turnover inventory.

Breakfast Committee - Base Commander Warren Branges. The next breakfast is 29 July 2018. We need servers for that morning. See COB Bob Bissonnette to volunteer.

52 Boat Memorial - Chair Base Commander Warren Branges- The next two "ALL FLAGS DAYS" - will be 14 June (Flag Day) and 4th of July. We will put up flags at 0700 and take them down at 1700.

Float Committee - Chair David Kauppinen - No Report.

Eagle Scout Program - Co Chairs Nihil Smith and Glenn Gerbrand. An Eagle Scout Court of Honor will be held for Troop 959 at San Carlos Methodist Church on 15 June. Nihil Smith and Glenn Gerbrand will make the presentation. All are invited to attend. Wear your vest and help us "show our colors". Glen's presentation on 21 April was exceptional and was commented on by many in attendance including the Troop Scoutmaster. Five more Eagle Scout Courts of Honor are in the works. Nihil and Glenn will advise as times and places are confirmed.

1930 - Base Commander called for a break. 50/50 Raffle held. Raffle Winner, Jessie Farley donated her winnings to the Base. One of the books in the auction was Blind Man's Bluff. A spirited discussion concerning the book's authors played out.

1950 - Unfinished Business

NATIONAL ELECTIONS will be held from 16 August 2018 through 15 October 2018. Ballots are available on the National Website and in the next American Submariner. Candidates are:

National Commander, Wayne Standerfer. National Senior Vice Commander Jon Jaques. National Junior Vice Commander Steve Bell. National Treasurer Paul Hiser. National Secretary Ray Wewers. Western Region Director Jim Denizen. Several Constitution and ByLaw changes will be on the ballot. Please read up on them and make sure you vote. The Election will be held using the old software/URL. The new website will be put up after the elections. We will have a computer setup to vote during the August meeting.

SCHOLARSHIPS - We will award 4 Scholarships at \$500 per this cycle. A new Policy and Procedures needs to be written to govern future scholarship awards. Anyone with ideas for Scholarship Fund Raisers please bring them to the next meeting.

THE SUBMARINE BIRTHDAY BALL - Southern California Bases sponsored WWII SubVets Charlie Tate, George Kinnison, Harold Staggs and Colly O'Gorman at the Submarine Birthday Ball. Southern California bases have contributed to offset the costs. San Diego Base, LA/Pasadena Base, Scamp Base, Bonefish Base and District 6 all contributed. The District 6 Commander also made a personal donation. Seventy-Five Year Qualified Certificates were awarded to Harold Staggs, Charlie Tate and George Kinnison. Harold Staggs was earliest qualified submariner in attendance. He was afforded the honor of cutting the cake. Former MCPON Rick West was the Keynote Speaker.

NAVY MUSEUM in ALPINE. The planned trip/meeting will be scheduled for 15 September 2018. Base Secretary Jack Kane will coordinate with Terry Ulmer. More information to follow.

SOUTHERN CALIFORNIA SUBVETS PICNIC - 14 July 2018. We need escorts and raffle prizes. Let the Base Commander know if you can volunteer for the picnic. We will have an Escort Watch Bill setup. Submarine Tours will be 0900 and 1300. Both tours are nearly fully booked. Only four spots are left for each tour. Let the Base Commander know if you have anyone to add to either tour. We have RSVPs from the following Southern California Bases: Trieste, Perch, Scamp for both the picnic and tours. We may also have attendees from LA/PASADENA Base, including WWII Submarine Vet Charlie Tate.

2030 - New Business

STORAGE FOR BASE GEAR - Our Base Gear and Storekeeper Inventory is currently being housed by several members in their garages, storage sheds, etc. We are looking for a better alternative. Please check with your local storage areas, etc, with an eye toward special rates and/or contribution in kind for a tax break. COB Bob Bissonnette will check availability at MCRD.

2033 - Good of the Order

2018 NATIONAL CONVENTION will be the Caribbean Cruise from Fort Lauderdale October 27 - November 3, 2018. Information and registration forms at the National Website (<http://ussviconvention.org/2018/>). 479 members are signed up. The following boats will hold reunions on the cruise: SS-241 Chivo, SS-484 Odax, SSN-585 Skipjack, and SSBN-619 Andrew Jackson. Final cutoff for signups is 15 July 2018.

SAN DIEGO BASE CHRISTMAS PARTY - 8 December 2018 - We will have the same menu as last year.

OUTYEAR CONVENTIONS are: 2019 Austin TX, 2020 in Tucson (needs final vote at next Convention), 2021 Orlando at the Rosen Shingle Creek.

JULIE BIEWER LAVERDIERE is doing a video project. She is recording interviews with SUBVETS. Recordings will be made available to SUBVET relatives (wives, children, siblings, etc). If you are interested see Julie after the meeting.

AMERICAN SUBMARINER - T. Michael Bircumshaw has taken over as Editor for the American Submariner. Please re-send articles previously sent and not published to Mike. He will publish as appropriate.

WELCOME TO NEW BASE MEMBER JOHN ZINICH. John gave a short synopsis of his Navy Career(s).

JIM POPE has a copy of the Official Report of Submarine Operations published in 1949. See Jim if you are interested in viewing the book.

The Meeting was adjourned at 2049

/s/ Jack E. Kane

Jack Kane, Secretary

Sailing List for 12 June 2018

Members

Bob Bissonnette
Jack Kane
Joel Eikam
Fred Fomby
Bob Farrell
Matt Baumann
Chris Stafford
Nihil D. Smith

Mert Weltzein

Ray Febrache

Ed Farley

Warren Branges

Chris Sultana

Nicholas Dirkx

Peter Lary

Dennis Mortensen

Joe Peluso

Paul Hitchcock

John E. Zinich

Jim Pope

Rus Stoddard

Phillip J. Richeson

Guests

Jessie Farley

Julie Biewer

Current News

**"Plataginet, I will; and like thee, Nero,
Play on the lute, beholding the towns burn" (Henry VI, Shakespeare)**

North Korea Submarine Development Signals Increased Nuclear Threat ***Andrew Jeong, Wall Street Journal, July 6***

SEOUL – North Korea is thought to be developing a new submarine capable of launching nuclear-armed ballistic missiles, a senior South Korean lawmaker said, signaling an increased threat to U.S. and allied forces while raising doubts about the regime's pledges to disarm.

Evidence gathered by South Korea's military suggests Pyongyang is working on the submarine on its east coast, said Kim Hack-yong, who chaired the legislature's defense committee until his term ended a few weeks ago. Mr. Kim, who belongs to a conservative opposition party that is skeptical of dialogue with Pyongyang, cited intelligence provided last week by defense officials.

Satellite imagery reviewed by South Korean intelligence officials showed the movement of laborers and materials at the port of Sinpo, where the submarine appears to be under construction at an indoor facility, an aide to Mr. Kim said.

A Defense Ministry spokesman said he couldn't comment on details pertaining to intelligence activities but stressed that Seoul and Washington continue to monitor North Korea's military facilities.

U.S. officials consider Pyongyang's submarine-launched ballistic missile program a threat because it would give North Korea a greater element of surprise in launching a nuclear strike. The U.S. Embassy in Seoul didn't respond to a request for comment.

The development, which comes as Secretary of State Mike Pompeo visits Pyongyang, adds to doubts about North Korean leader Kim Jong Un's commitment to denuclearize following his agreement with President Donald Trump in Singapore last month. Their joint statement lacked specifics, leaving the regime wiggle room as to what exactly constitutes denuclearization.

In Pyongyang on Friday, Mr. Pompeo was expected to press North Korean officials for concrete steps to deliver on those pledges, such as a timeline for disarmament.

In recent days, though, satellite images have indicated North Korea is expanding a missile-production facility and erecting a new building at one of its plutonium-producing reactors.

Meanwhile, North Korea appears to be preparing for its annual summer military exercises and hasn't ceased sending orders to its spies in South Korea through coded messages, added Mr. Kim, the lawmaker.

The latest evidence shows the need to maintain pressure on North Korea and force the regime to negotiate, said Yang Uk, the chief defense analyst at Korea Defense and Security Forum, a Seoul-based private think tank.

"It's too early to say if the North Koreans have defaulted on the Singapore agreement to denuclearize," he said. "But earlier satellite images have already shown enough evidence proving North Korea has not abandoned its SLBM program." SLBM is an abbreviation for "submarine-launched ballistic missile."

Hwang Jin-ha, a retired South Korean Army lieutenant-general and the former chairman of the defense committee at the country's legislature, said he believed the latest information to be credible. Mr. Hwang, a former lawmaker, belongs to the same party as Kim Hack-yong.

North Korea's navy operates a fleet of about 70 submarines, alongside 430 surface combat ships, according to South Korea's Defense Ministry. It also maintains 250 amphibious vessels and 20 minesweepers.

South Korea's navy has about 10 submarines, according to the ministry. It maintains 110 surface combat ships and 10 amphibious vessels. Seoul, however, possesses advanced assets, including three Aegis-equipped warships able to intercept incoming ballistic missiles.

The North's pursuit of nuclear weapons and intercontinental ballistic missiles has led to several rounds of sanctions against the regime and threats of U.S. military action from Mr. Trump.

But a detente has emerged this year, driven in large part by South Korean President Moon Jae-in, bringing the U.S. and North Korean leaders to their first meeting.

Mr. Kim, the third-generation dictator, has declared his nuclear force complete and said he wanted to focus on rebuilding his sanctions-strained economy.

After the Singapore summit, the U.S. and South Korea agreed to suspend military exercises that had angered Pyongyang and that Mr. Trump had described as provocative and expensive.

The regime, meanwhile, agreed to return the remains of U.S. military personnel killed in the 1950-53 Korean War. That hasn't happened; it wasn't immediately clear whether Mr. Pompeo's trip to Pyongyang would yield progress on that front.

Russia Offers To Jointly Design, Build Submarines ***Manu Pubby, The Economic Times, July 6***

NEW DELHI – India has received a joint submarine design and construction proposal from Russia to build on the technology transfer acquired while building the nuclear fleet, and promises to drastically reduce the cost of Navy's next-generation vessel plan.

The proposal, believed to have been discussed at the top level during the Sochi summit in May, offers an alternative to an upcoming \$10 b P 75I tender for six new diesel electric submarines that the Navy requires. These are to be fitted with an Air Independent Propulsion (AIP) system that significantly increases their ability to stay underwater.

"The Russian side has offered a transfer of all intellectual property for the design and prototype construction. This will mean that there are also no limits to the number of submarines that can be built under the project...." officials familiar with the details told ET.

While the current plan is to go in for a global competitive process that will involve companies from Russia, France, Germany and Sweden, the official proposal from Moscow is for a government-to-government deal for joint design with the Advanced Technology Vessel Project (ATVP). This is the project that gave India its first nuclear armed submarine, the INS Arihant, which was constructed in Vizag with considerable assistance from Russia.

A line of nuclear armed and nuclear powered submarines will be rolled out under the project which has completed the Indian nuclear triad -- the ability to launch warheads from air, land and underwater.

Sources told ET that the proposal is for joint design and building of a prototype, following which the technical knowhow and papers would be transferred to the selected Indian shipyard for construction. The design consultancy for the project is

pegged at under \$200 million, something that could result in savings of immediate payments for the Navy for its next-generation submarines.

Under the competitive process, an initial payment of over \$ 2 billion (20% of total cost) might be necessary, which given the Navy's current budget projections, seems difficult. The proposal seeks to design the submarine to meet Indian requirements, including installation of the Brahmos missiles on board, as well as a jointly developed AIP system with the Defence Research and Development Organisation.

Sources involved in the Indian nuclear submarine project said that the proposal can build on the technology that has already been transferred to India but has to be scrutinized carefully to ensure that critical knowhow is not held back. Several parts required under the proposal are already being produced in India, including high strength steel for submarine hulls.

Kitsap Is Home To Navy's First Unmanned Undersea Vehicle Squadron Julianne Stanford, K5 News, July 4

For the past 100 years, Keyport has been home to one of Navy's primary efforts to research, develop and test torpedoes, which earned the small, waterfront community the moniker of "Torpedo Town, U.S.A."

Now, Keyport's Naval Undersea Warfare Center is becoming the modern testing ground for a new type of technology that silently operates in the depths — unmanned undersea vehicles, which are known as UUVs.

Those unmanned undersea vehicles are essentially "pre-programmed, small submarines," said Cmdr. Scott Smith, commanding officer of the Navy's newly formed Unmanned Undersea Vehicle Squadron 1.

The squadron's UUVs range from 10-inch torpedo-shaped tubes to large submersibles more than 80 inches in diameter. Many of the UUVs used at Keyport are commercially available, from companies like Bluefin Robotics or Riptide Autonomous Solutions.

The squadron has been tasked with developing the tactics, techniques and procedures that will shape how the Navy will use the unmanned undersea vehicles.

Eventually, the Navy will use UUVs for a variety of missions. Today, they are capable of reducing the risk to divers in the water and extending sensory capabilities for underway submarines, Smith said.

"We'll use UUVs in those areas that are too dangerous to put a manned vessel, and on the other side, we'll use UUVs where it's just too mundane for a long-term mission to keep a sailor out there," Smith said.

"Those are really the two places I see UUVs working, but we'll never replace the manned systems. In my mind, we'll always need submarines out there doing what submarines do."

The Navy currently doesn't operate unmanned undersea vehicles from submarines, but Smith foresees a potential for rapid growth with the platform.

"Five years down the road," Smith said, "I'd like to see two UUVs on every submarine in the fleet."

The squadron has already tested its expertise and training with a few real-world situations. It has helped to recover a lost item in Sinclair Inlet that fell over the side of a patrol boat. It assisted the Royal Canadian Mounted Police track down a misplaced piece of equipment in the Nanoose Range near Vancouver Island, British Columbia.

In another instance with significantly higher stakes, a team of six of the squadron's sailors deployed in December to assist with the international search and recovery efforts of the Argentinean navy's lost submarine, A.R.A. San Juan, in the south Atlantic Ocean. The submarine disappeared Nov. 17 with 44 crew members aboard.

Although efforts to locate the submarine's whereabouts have been unsuccessful, the crew was able to provide assistance in the early days of the search efforts with the UUVs' capability to perform side-scanning sonar, which uses sonar echoes to create images of large areas of the seafloor.

A growing force

In the past year, the squadron has grown from 28 sailors with a handful of operational UUVs to 35 sailors and more than a dozen UUVs. By next fall, Smith said the squadron's manpower will almost double in size and, by fiscal year 2023, it is projected to quadruple from its current size.

With that growth, Smith said the Navy is interested in adding billets that could bring subject matter experts to the squadron, such as meteorologists who could analyze sea conditions for operational planning or operational specialists from the surface community.

"We recognize there's going to be UUV operations from all facets of the Navy and we don't want to stovepipe ourselves just into submarines," Smith said.

Unlike its aerial counterparts, once an undersea drone is launched, it can't be controlled by an operator on the ground. That means before launch, a UUV's entire mission protocol has to be coded in advance of getting underway.

"Once they go underwater, you can't control them with any type of Wi-Fi or signals," Smith said. "Within about 2,000 yards, you can do acoustic; you can put beeps and bops into the water with very, very small messages, to tell them to come up to the surface or to tell them to abort."

Operations typically start with a mission briefing early in the morning, and their execution can take anywhere from 15 minutes to 30 hours.

For the most part, the UUV's size determines the length of time it can be in the water and what type mission it will be sent on.

"We're limited by power. So if you want a long duration, long stay time with a heavy use payload, you're not going to get that from a small one," Smith said.

While underway, smaller UUVs are typically used to gather imagery, survey sea conditions or extend the sensor reach of sub. Larger unmanned undersea vehicles can take on more complex missions, such as acting as an independent sensor on its own mission.

Getting the UUV into the water is the easy part, but at the end of the mission, recovery can prove to be more difficult, Smith said.

"Once you find the UUV, you have to get close enough that you can snare it or hook it without getting too close to damage the side of the boat," Smith said.

Smaller ones typically require a two-man lift. Medium ones require a specialized trailer — Smith calls it a modified boat trailer. Sailors in immersion suits escort the UUV into the trailer.

After recovering the UUV, crews bring back the data they collected.

For some of the squadron's sailors, being a part of the work to develop the Navy's UUV policies has been a key part of their career.

"It's exciting, something I've just heard whispers of, and now to be able to be hands-on with it is really exciting," said Electronics Technician 1st Class Andrew Hanashiro.

Hanashiro, who has been with the squadron for four months, said the best part of working with the UUVs is to get them out on the water the water for training.

"I just have stars in my eyes every time I see these vehicles," he said.

Electronics Technician 1st Class Eric Maculanlan has been with the squadron for more than four years. He was on the cusp of deciding to get out of the Navy when he learned about the possibility of working with the UUVs.

"It was new to me. It sounded like something fun to do," he said. "It's a lot different aspect and view of the Navy and what happens in the Navy other than being on a submarine with operational life."

First of a kind

Last fall, the Navy decided to formally establish the squadron, and it began operating on Oct. 1.

The squadron is a part of Submarine Development Squadron 5, which is the operational command that oversees the Seawolf-class nuclear-powered fast attack submarines USS Seawolf, USS Connecticut and USS Jimmy Carter.

Keyport is the natural place to locate the new command, said Capt. Doug LaCoste, commanding officer of NUWC Keyport.

"The goal is that (they'll be able to) leverage some of the knowledge that Keyport has in recovering these UUVs that we call torpedoes, which we've done for decades," LaCoste said.

In one instance, one of the squadron's undersea vehicles crushed its nose cone after colliding with an uncharted rock out in the water near Keyport during a training exercise.

Without the shore installation's assistance, it would have taken months to obtain a replacement nose cone from the manufacturer and get the UUV back in working order. Instead, the UUV was back in business a few days later after Keyport was able to 3D print a replacement nose cone in about a day, Smith said.

Smith said the installation's proximity to the water makes it an ideal place for testing the squadron's tech.

"We can pick a UUV right up and you and I can carry it out to the water right out there and put it in," he said.

The squadron is housed in Keyport's Barb Hall, which is named after the legendary World War II-era Gato-class submarine USS Barb.

The Barb is credited with an impressive wartime record, with 12 war patrols. The sub sank five Japanese warships and damaged or sank 34 merchant ships. Most notably, the submarine is credited with "sinking" an enemy supply train after crew members snuck ashore Japanese soil and set up explosive charges on the train track.

"The idea is that the Barb did new and different things, things that were outside of the box," LaCoste said. "That's the idea of bringing UUVRON here."

As the squadron's size and mission grows, LaCoste said Keyport was looking forward to continuing to support the Navy's development of the technology.

"It's going to grow, and what I want to do is to be ready for the growth," LaCoste said. "As UUVRON develops the tactics to be able to operationally use UUVs, we need to have the infrastructure, we need to be able to test them out here locally and provide feedback."

With that expansion, Smith said it was important for the squadron to continue to build upon Keyport's reputation as a considerate neighbor to those who live in the community around the installation.

"We want to make sure everyone on the water knows what we're doing and make sure that we're respectful to the recreational boaters right to be out on the water," Smith said. "I think that's important for people to know that the military cares and my sailors certainly do."

***Navy Testing Coating That Could Allow Submarines, Other Ships To
Glide More Easily Through The Water***
Julia Bergman, The Day, July 3

The Navy is researching a new coating that could be used on submarines and other ships to help them glide more easily through the water, reducing fuel costs.

The substance, known scientifically as a superhydrophobic coating, repels water, reducing the drag created by a hull moving through the water. The Navy says it could save millions of dollars in ship fuel costs.

The coating has millions of pockets of air trapped underneath, which essentially create an air film that causes water to slide off a surface. That results in lower friction and significantly reduces drag.

"As much as 60 percent of fuel can be used on drag, maybe higher depending on speed. We have the potential of cutting that significantly," said Anish Tuteja, an associate professor of materials science and engineering at the University of Michigan, whose research the Office of Naval Research is sponsoring.

These repellent coatings aren't new. Tuteja's group has been doing this research for more than a decade, but it's hard to find a solution that's durable, especially when the environment is as harsh as the ocean.

"For this particular application, you have to get the texture exactly right. If the pores are too big, the water can essentially go into the pores and then it gets in and the drag actually increases, and if the pores are too small it doesn't create enough drag, so it had to be in the right regime to create drag," Tuteja said.

Tuteja and his team analyzed hundreds of chemical combinations before finding the right mix.

The goal is to make the coating last for several years, Tuteja said, and it could be applied by a spray similar to how paints are currently applied to the hull of a ship. The coating has a rough white surface because it has to be textured to create the air pockets, Tuteja said.

His team is also working on coatings that repel other liquids beside water, like oil, alcohol, and even peanut butter. Those coatings are being tested for a range of Pentagon uses such as for soldiers' uniforms and protective eye wear.

While there are various commercial applications for these coatings like preventing stains from liquids such as soda, juice, and alcohol on carpets and clothing, coatings for Navy application require "a lot more proving out," Tuteja said. It would be at least a few years out before they go onto ships.

China's First AIP Submarine Unit Breaks Records
Staff, Navy Recognition, July 5

China's first submarine unit using air-independent propulsion (AIP) technology recently broke a number of records set by the Chinese navy, Science and Technology Daily recently reported.

Records such as the longest sailing distance, maximum submergence depth and sinking target ships under boundary conditions were all broken by the unit.

Military commentator Zhang Haixiong disclosed that submarines equipped with AIP technology prolong operation duration underwater to about two or three weeks, indicating the increasing stealth of the submarines.

The time a conventionally powered submarine can spend underwater ranges from 10 to 100 hours, as they need to surface regularly to charge. However, submarines can be charged underwater if they are equipped with the AIP system.

Zhang noted that AIP submarines, with higher combat effectiveness, are second only to nuclear submarines, adding that although AIP submarines are more expensive right now, in the future they will become the conventional option.

3 Subs Of WWII Japanese Navy Found Almost Intact In Sea Of Japan
Staff, Kyodo News. July 3

Three Imperial Japanese Navy submarines, including a U-boat transferred from Nazi Germany, have been found lying almost intact on the seabed in the Sea of Japan off Kyoto Prefecture, researchers said Tuesday.

The researchers have identified the names of the submarines, which survived World War II but were scuttled by the U.S.-led occupation forces in 1946.

The submarines -- the RO-68, built in 1924, the I-121, built in 1927 and the RO-500, a German U-boat given to Japan in 1943 -- were lying on the seabed about 90 meters deep in Wakasa Bay, according to Tamaki Ura, a professor at Kyushu Institute of Technology and member of the research team.

The team searched the area in June using sonar and an unmanned submersible.

All three submarines have retained most of their original form, helping the team to identify them from the shape of their bows or the length of their bodies, the researchers said.



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