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

The Silent Sentinel
September 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.

What Happens at ICEX, Stays at ICEX

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San Diego Base

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Paul Hitchcock

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: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

EMAIL: _____

TELEPHONE: _____

Would like the SILENT SENTINEL emailed: YES_____ NO_____

USSVI Base Commander
c/o VFW Post 3787
4370 Twain Ave.
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*

September Meeting

Information concerning our September meeting can be found after the minutes from our August 2018 meeting.

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

BINNACLE LIST

Frank Walker and Tom Polan

Submarine Losses in September

Originally Compiled by C J Glassford

USS S-5 (SS-110)
Lost on September 1, 1920 when a practice dive went wrong and she sank bow-first, with her stern showing above the water. In a dramatic adventure, her exhausted crew was rescued during the next few days. Salvage attempts were unsuccessful, S-5 settled to the bottom and was abandoned.

USS Grayling (SS-209)
Lost on Sept 9, 1943 with the loss of 76 men near the Tablas Strait. Grayling was on her 8th war patrol and sank two ships before being lost.

USS Pompano (SS-181)
Pompano was sunk (between Sept 17 and Oct 5) with the loss of 77 men while on her 7th war patrol. Possibly lost on Sept 17, 1943. Japanese records show that a submarine was sunk in her patrol area on 17 September by air & depth charge attack off the Aomori Prefecture near Shiriya Zaki. Before being lost, she sank two enemy cargo ships. The exact cause of her loss remains unknown, but she probably was sunk by the air/sea attack above or fell victim to a mine on or after 9/25/1943. This boat's last recorded ship (Taiko Maru) sunk happened on Sept 25th, so she probably hit a mine on or after that date but before Oct 5th, when she was scheduled back at Midway.

USS S-51 (SS-162)
Lost on Sept 25, 1925 with the loss of 33 men when it was sunk after collision with SS City of Rome off Block Island.

USS Cisco (SS-290)
Lost on Sept 28, 1943 on her first war patrol with the loss of 76 men in the Sulu Sea west of Mindinao.

San Diego Base, United States Submarine Veterans Inc.
Minutes of Meeting - 14 August 2018
VFW Hall, 4370 Twain Avenue, San Diego CA 92120

1901 - 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 August. Junior Vice Commander Manny Burciaga recognized Past Commanders, dignitaries and guests.

Base Secretary Jack Kane announced 23 members and 3 Guests present.

Base Treasurer Joe Peluso presented the Treasurer's report. A copy of the Report will be filed with these minutes. One Scholarship check is not cashed.

Minutes of the July meeting were published in the Sentinel. Those minutes were accepted as published. These minutes will be published in the Sentinel.

Base Commander Warren Branges called for Committee Reports

Binnacle List - Base Commander Warren Branges reported Frank Walker and Tom Polan on Binnacle.

Parade Committee - Base Commander for Joel Eikam. Next Parade is Poway on 8 September at 1000. We will not be attending the Borrego Springs Parade in October. The final parade for 2018 will be Veterans Day Parade, Saturday, November 10th in San Diego.

Membership Committee - Chairman Ray Febrache. No Report. Ray not in attendance

Scholarship Committee - Committee Chairman Paul Hitchcock. Next Scholarship Round in the spring.

Storekeeper - Paul Hitchcock. Final SK Turnover and inventory will be done soon.

Breakfast Committee - Chair Base Commander Warren Branges. The last Breakfast netted over $400.00. The next Breakfast will be 30 September if the VFW is finished with the kitchen renovations.

52 Boat Memorial - Chair Base Commander Warren Branges- The next All Flags Day will be 21 September (POW/MIA Day). We will put up flags at 0700 and take them down at 1700. We are inviting the Point Loma Association to participate. The Point Loma Rotary donated $500 to the memorial.

Float Committee - Chair David Kauppinen - No Report. The Committee will be looking at Wheel Bearing Maintenance and the hull wrinkling over the winter.

Eagle Scout Program - Co Chairs Nihil Smith and Glenn Gerbrand. Five more Eagle Scouts have passed their Boards. Courts of Honor are in the works. Nihil and Glenn will advise as times and places are confirmed.

1935 - Base Commander called for a break. 50/50 Raffle held.

1947 - Unfinished Business

NATIONAL ELECTIONS will be held from 16 August 2018 through 15 October 2018. Paper Ballots are available on each table. If you want to vote by paper ballot fill one out and return it to COB. You can vote on the National Website. Please don't do both. 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.

Southern California SUBVETS Picnic was held at Naval Base Point Loma on Saturday 14 July. We had 115 adult attendees. We feed approximately 140 people including kids and several sailors who were working the gates.

NAVY MUSEUM in ALPINE. The planned trip/meeting will is scheduled for 1000 on 15 September 2018. We will have the Base Meeting followed by submarine model dedication, a picnic and tours of Terry Ulmer's MOPAR Park Navy Tribute Facility. See attached flyer for details.

STORAGE FOR BASE GEAR. We are still looking for a storage area for Base Gear. If you know of any storage area that would be willing to give "in kind" or drastically reduced rate storage see the Base Commander. We also be cleaning out our storage area at the VFW at 0800 on Saturday, August 18th.

ADVERTISEMENT IN NATIONAL CONVENTION BROCHURE. The ad approved at last meeting is ready to go to the printer. The ad will focus on promoting visits to the 52 Boat Memorial in San Diego. Cost of the ad is $250. Donations were taken and over half the cost was covered. The Base will pay any remaining cost. A copy of the ad is attached.

2009 - New Business

We will be doing a Financial Review before the end of the year. If you want to be on the Committee see the Base Commander

2010- 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/). 506 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. If you want to attend see the Base Commander. Some spots are still available.

SAN DIEGO BASE CHRISTMAS PARTY - 8 December 2018 - We will have the same menu as last year. Cost is $20.00 per person. A flyer will be forthcoming.

OUTYEAR CONVENTIONS are: 2019 Austin TX, 2020 in Tucson (needs final vote at next Convention), 2021 Orlando at the Rosen Shingle Creek. Many Base Members highly recommend seeing the Museum of the Pacific (Fredericksburg TX) as part of the festivities in Austin 2019.

SILENT SERVICE TV SERIES - Is available for download at olgoat.com.

A DSRV/DSV Reunion is in the planning stages for 2020 - to be held in San Diego.

THRESHER Presentation. CAPTAIN (ret) Jim Bryant will give a presentation at the San Diego Archaeological Center in Escondido on Saturday September 8th at 1100. Flyers on the back table.

COB Bob Bissonnette pointed out that today is VJ Day.

Shipmate JJ Lynch suggested that we may want to look into a fund raiser along the lines of that done by Bremerton Base. Bremerton Base sends each of their members a Submarine Calendar along with a request for $20 donation. THE VETERANS WALK to benefit Veterans Home Chula Vista will be held on 3 November 2018. Base Storekeeper Paul Hitchcock will research and let us know how to enter a team.

USS SABALO will have a reunion in San Diego on 11 November 2018.

WREATHS FOR 52 BOAT MEMORIAL. The Point Loma Association is going forward with plans to place wreaths at the 52 Boat Memorial. Wreath sponsorship will be approximately $15.00. More information at the next meeting.

NO MEETING ON TUESDAY, 11 SEPTEMBER 2018

NEXT MEETING WILL BE ON SATURDAY 15 September 2018. Meet at 483 PEUTZ VALLEY ROAD, ALPINE CA 90901

The Meeting was adjourned at 2025

/s/ Jack E. Kane
Jack Kane, Secretary

Sailing List for 14 August 2018

Members
Fred Fomby Bob Bissonnette
J.J. Lynch Warren Branges Bob Farrell
Joel Eikam Jack Kane
David Martinez John Zinich Peter Lary
Bill Earl
Mert Weltzien Chris Stafford Joe Peluso
Dennis Mortensen
Paul Hitchcoc k
Ed Farley
Nihil D. Smith

Nicholas Dirkx
Russ Stoddard
Brad Styer
Manny Burciaga
Don Mathiowetz

Guests
Jessie Chang Farley
Jan Gustavel
Juanita Williams

To All Jewish Submariners

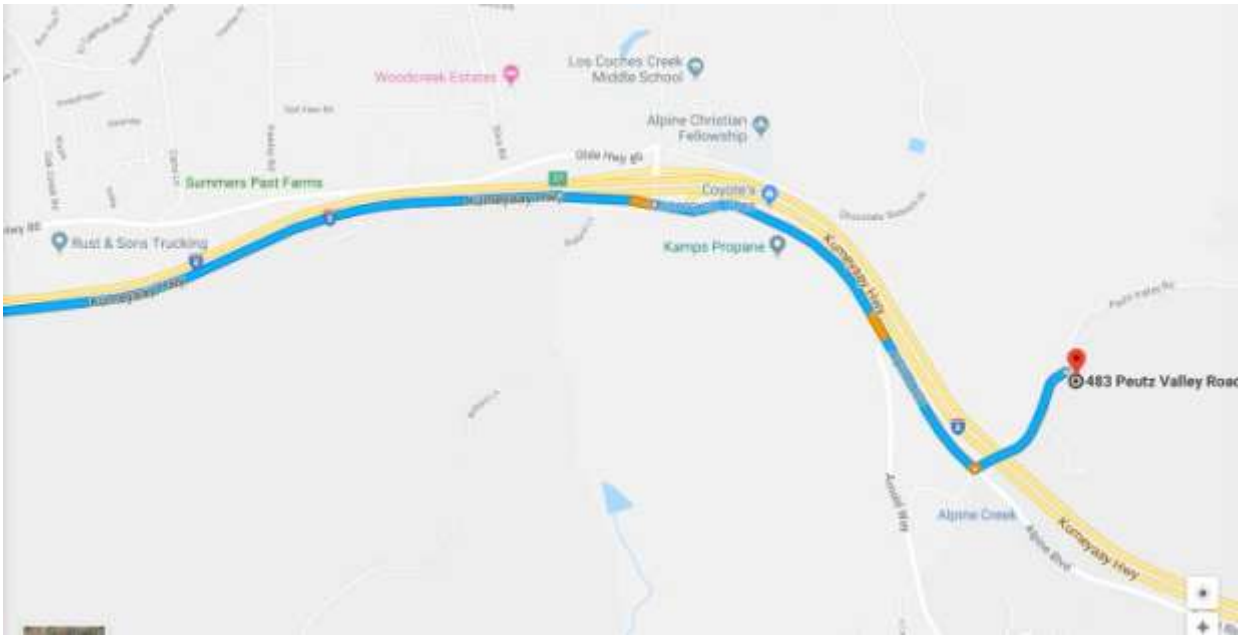
San Diego Base USSVI
NO MEETING ON TUESDAY 11 SEPTEMBER 2018

September Meeting will be held on
SATURDAY 15 SEPTEMBER 2018 at 1000

Meeting Place will be
483 Peutz Valley Road, Alpine CA 90901

Take I-8 East to Exit 27 Harbison Canyon Road/Dunbar Lane
At Bottom of Ramp continue straight on Alpine Blvd approx 1 mile to
Puetz Valley Road, turn left, 483 Peutz Valley Road is 3/10th of a mile on the right.
MEETING AT 1000

Submarine Model Dedication at 1100
Hot Dogs, Hamburgers and Tour after the Dedication.
For Questions/Directions Call Base Secretary Jack Kane at 619-602-1801



Silent Sentinel EXCLUSIVE!

Judith and Gary Murphy have graciously consented to allow the Silent Sentinel to republish their collection of USS Whale, SS-239, ship's newspaper, "THE RAG," from the WW-II era! Gary's father, Rex Murphy, served as Whale's Engineering Officer. The Silent Sentinel will now include a copy of The Rag in each issue. The Murphy's and I hope that you will find it an interesting reading experience. The date is March 14, 1943. Whale is in the waters nears Tanapag Harbor, Saipan, in the Marianas. "The Rag" No. 2

SIXTH EDITION MARCH 14, 1943

"NOTHING IS DONE FINALLY AND RIGHT.
NOTHING IS KNOWN POSITIVELY AND
COMPLETELY" Readers digest.

MALICIOUS CRITICISM DIRECTED AT RAG-------AMAZING DISCOVERY MADE TODAY

Late this evening, a great deal of criticism was directed at the peoples paper the RAG, by the so called intellectual groupe of whom the leader is better known as; BUM DOPE, NO. ONE UNIC or I'LL BE IN MY SACK ON MY BACK IN THE FORWARD ROOM, LADY LITTLE.

During the discussion, it was discovered that LADY LITTLE was only aware of the existance of one engine room on the MIGHTY WHALE.

To correct this lack of knowledge, the re-write journalist of the RAG, took it upon himself to familiarize LADY LITTLE with that part of the ship abaft the crew's head known as the engine houses No. one and No. two.

After much persuation and with a final promise that he wouldn't be subjected to wittnessing the where abouts of the golden rivet, (Note the golden rivet is not situated in either of the two engine rooms) We were finally able to entice him to the forward engine room.

After a great deal of trouble and expended energy, in explaining the mysteries of the two engine rooms, LADY LITTLE with a look of muttled understanding exclaimed, "Now I know what makes the ship go backwards!" Little was immediately set upon to explain the where-for and why of his startling deductions. "Why---that's very simple" exclaimed LADY LITTLE with a look of hurt surprise. "Anyone with a dit-dah-dit of sense can see that by the positions of the engines, that the engines in the front engine house drive the ship backwards while the engines in the back engine house drive the ship frontwards..

This can be readily #### ascertained noting the relative positions of the forward and after engines to each other."

Well-----After the smell of burning ham (HAM--an amateur radio operatof, of which we have plenty) had cleared away, Ye olde instructors bailed out immediately. Now rumors have it that LADY LITTLE has established herself in the after engine room, giving the boys lectures on the relations of machanics to radio.

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Late this evening in the half light of dusk, the MIGHTY WHALE, left the Saipan area for the lighter breezes of the sea lanes, to mull over and decide, or what ever it is submarines do when they mull over anything, the non response to the helpful suggestion that was submitted to the Japanese naval authorities pertaining to the unloading of Nip ships by our BOYS-IN-BLUE.

The lack of response by the Nips shows that they are at the RATS end as to what course of action to follow.

We feel surethat, if our present policy if carried out to the fullest extent of our ability will bring the Nips around to seeing things our way.

Keep your eyes peeled for further developments as disclosed by the RAG first with the latest.

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SPORTS

This afternoon in the feeble glow of the after battery, that muscle bound between the ears, weight lifting, fashion plate, bone crushing man about town BUCKHIEM defeated I'll learn to blow this damn head without taking a bath, bearcat of the foward room SEVERANCE in the championship finals.(cribbage) Purse----$7.00

After the winner was declared drinks were served as usual. Both Champion (chump) and contender turned in their sacks from sheer exhaustion.

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It has been rumored about that the intellects are coming out with an instruction book on the Care operation and handling of Submarines. The title, it is said will be; TAKE HER DOWN LIEUTENANT --------, or TWO DEGREE UP ANGLE WITH A FOUR DEGREE DOWN BUBBLE. We are sure that this book will be a huge success.

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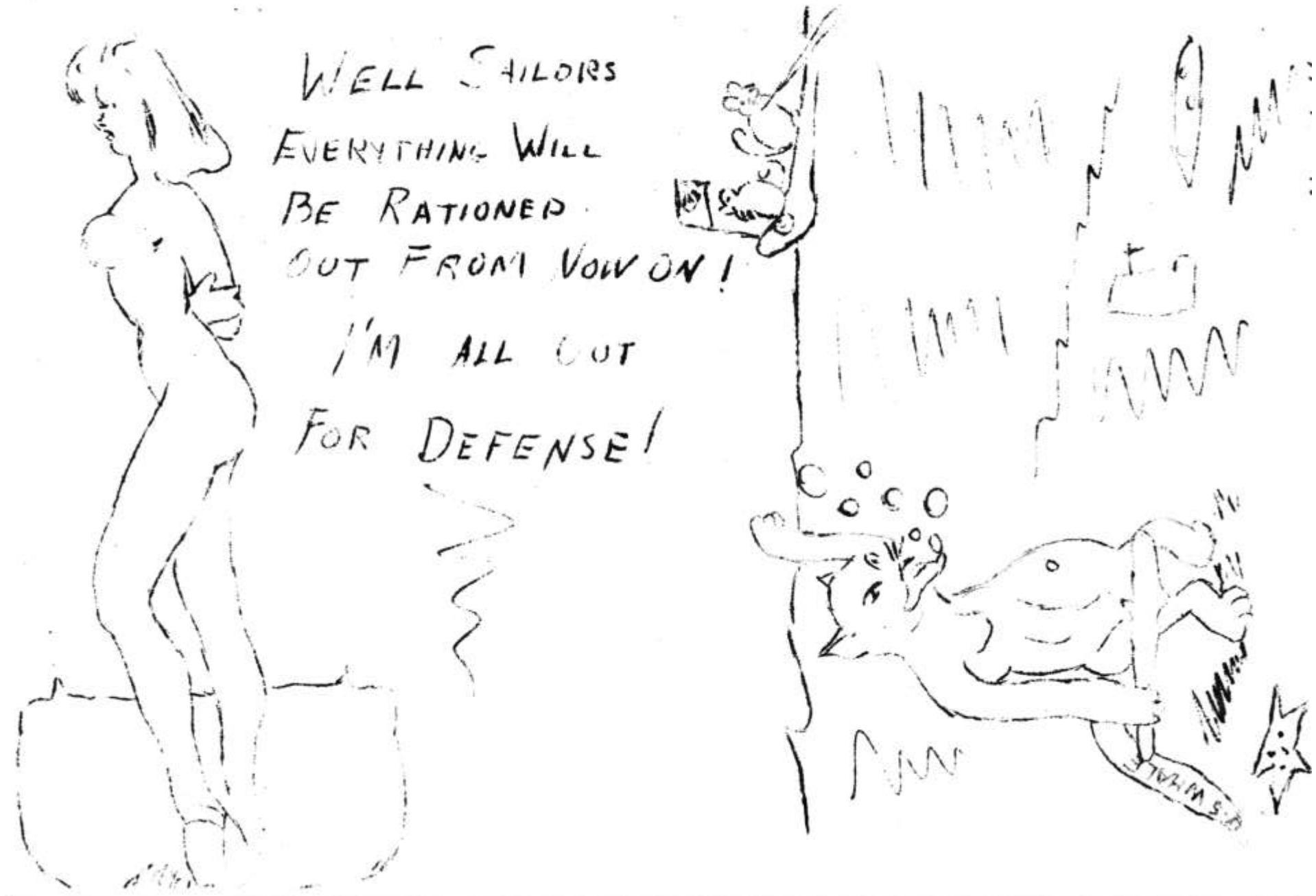
MARRIAGE; is a public confession of intended intimate relations.
-Readers digest----------


WELL SAILORS
EVERYTHING WILL
BE RATIONED
OUT FROM NOW ON!
I'M ALL OUT
FOR DEFENSE!
U.S. WHALE

Current News

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

The Navy Thinks Russian Subs Are A Growing Threat To Europe, And It's Mounting A Full-Court Press To Counter Them

Christopher Woody, Business Insider, September 5

US and European officials have warned repeatedly in recent years that more sophisticated and more active Russian submarines pose a growing threat, and NATO countries are taking steps to counter that perceived challenge.

Adm. James Foggo, head of US Navy forces in Europe and Africa, has said that a "fourth battle of the Atlantic" — which comes after the naval warfare of World War I, World War II, and the Cold War — is already being fought, and it ranges far beyond the waters of the Atlantic.

"I've used the term in some of my writings that we are in a 'fourth battle of the Atlantic' right now, and that's not just the Atlantic," Foggo said on the first edition of his podcast, "On the Horizon," published at the end of August.

"That's all those bodies of water I talked about, the Arctic, the Baltic, the Mediterranean Sea, the Black Sea, and the approaches to the Straits of Gibraltar and the GIUK gap, and the North Atlantic," he added, referring to waters between Greenland, Iceland, and the UK that were a focal point for submarine activity during the Cold War.

While some intelligence estimates from the Cold war indicate that current Russian sub activity is still well below peaks reached during that time, US and European officials have been expressing concern for the past several years.

"The activity in submarine warfare has increased significantly since the first time I came back to Europe and since the Cold War," said Foggo, who previously commanded the Navy's 6th Fleet. "The Russian Federation navy has continued to pump rubles into the undersea domain, and they have a very effective submarine force."

That force's readiness has also improved to the point where the Russian navy can keep some of them deployed most of the time.

US Chief of Naval Operations Adm. John Richardson told lawmakers earlier this year that Moscow has "really stepped on the gas," with its subs, "both in technology and in ... the amount of time that they're spending abroad."

Russia's newest class of submarines, Yasen-class subs, have drawn comparisons to the US Navy's best subs, and Moscow matches that technical progress with the geographic advantage of being able to deploy from bases on the Barents, Baltic, and Black seas.

Some of Russia's Kilo-class subs, which are newer, more advanced diesel-electric boats, are able to launch Kalibr cruise missiles from those areas and reach "any of the capitals of Europe," Foggo said.

But, he added, the best way to track these boats is not just with other submarines.

While Foggo was a planner at the Pentagon, Adm. Jonathan Greenert, then the Navy's chief of operations, "would often say, 'Hey, look, the best way to find another submarine is not necessarily with another submarine. That's like a needle in a haystack,'" Foggo said.

A more effective approach draws on the submarine, surface, and air assets to put a full-court press on rival subs.

Anti-submarine warfare "is a combined-arms operation, and let no one forget that," Foggo added, saying that it involved all the US Navy Europe and Africa's assets as well as those of the 6th Fleet, which is responsible for the eastern half of the Atlantic from the Arctic to the Horn of Africa.

NATO navies, and many other navies around the world, have increased their attention to anti-submarine-warfare capabilities in recent years, adding improved technology and spending more time practicing. One sign of that focus has been the growing market for sonobuoys, which are used to hunt targets underwater.

In early 2017, US Navy ships deployed in the eastern Mediterranean engaged in the tricky game of tracking the Krasnodar, a Russian attack sub whose noise-reducing capability earned it the nickname "The Black Hole."

Sailors in the USS George H.W. Bush carrier strike group were tasked with following the elusive Krasnodar, despite having little formal training in anti-submarine operations.

"It is an indication of the changing dynamic in the world that a skill set, maybe we didn't spend a lot of time on in the last 15 years, is coming back," Capt. Jim McCall, commander of the air wing on the USS Bush, told The Wall Street Journal at the time.

Cmdr. Edward Fossati, commander of the Bush strike group's sub-hunting helicopters, told The Journal that improved tracking abilities had helped keep things even with Russian subs' improved ability to avoid detection.

But the Navy has had to keep pace in what Navy Secretary Richard V. Spencer has called "a constant foot race."

Navy surface forces let their focus on ASW "wane considerably" in the years after the Cold War, Bryan Clark, a senior fellow at the Center for Strategic and Budgetary Assessments, said in an interview earlier this year.

"Up until a few years ago, their ASW systems were not modernized to deal with new Russian and Chinese subs," said Clark, a former submariner, but the Navy has added new, improved gear, like processors and towed arrays, that have increased their capabilities.

"Surface ships are able to get back into the ASW business," Clark said.

US And Russia Expected To Restart Nuclear Arms Dialogue At Talks

Julian Borger, Andrew Roth, The Guardian, August 23

WASHINGTON/MOSCOW – The US and Russia are expected to agree to resume a dialogue on nuclear arms and other strategic issues when their security officials meet in Geneva.

The meeting on Thursday between John Bolton, the US national security adviser, and his Russian counterpart, Nikolai Patrushev, is a follow-up to the Helsinki summit between Donald Trump and Vladimir Putin in July.

Senior US officials know little about what the two leaders discussed in a one-to-one session that lasted two hours. But in the weeks following the summit, it became clear that both sides see value in the resumption of a strategic stability dialogue that stalled last year.

It is less clear whether such a dialogue can lead to agreement on the major substantive issues that divide the two countries, including arms control, Syria, Ukraine and sanctions.

A week after the Helsinki summit, Russian officials told a group of visiting US academics, analysts and arms control advocates that their priority was a resumption of high-level talks on strategic issues.

Daryl Kimball, the executive director of the Arms Control Association, who was part of the US group in Moscow, said: "The Russians basically said, in Helsinki through Putin, we want to resume the strategic stability talks."

He said the list of talking points the Russians want discussed includes the possible extension of the 2010 new start treaty limiting deployed strategic nuclear weapons and delivery systems. The treaty is due to expire in 2021 and if it is not extended or replaced, the US and Russian arsenals, accounting for more than 90% of the world's nuclear weapons, would be unchecked by any arms control agreements for the first time since 1972.

Russian officials have blamed the US for failing to specify a stance on renewing the treaty.

"Time is running out," said the deputy foreign minister, Sergei Ryabkov, in an interview this week.

"Why not taking advantage of this opportunity?" he said, noting that Trump and Putin had brought up the treaty in Helsinki, but the US side had failed to follow this up. "We cannot currently say conclusively and for certain why, but unfortunately there is no response."

A Russian adviser to the government on foreign affairs told the Guardian that arms treaties would be Patrushev's "number-one focus" and this was one of the few areas where the Kremlin hoped for progress in the current environment of sanctions and anger towards Russia in the US.

The Pentagon has signalled its support for a resumption of dialogue on nuclear arsenals.

Speaking at the Aspen security conference in July, the undersecretary of defence, John Rood, said: "We would also like to talk more about strategic stability, making sure there are clear understandings between the United States and Russia about these terribly lethal weapons that we both control, and talk about the future of nonproliferation."

Steven Pifer, a deputy assistant secretary of state in the bureau of European and Eurasian affairs in the George W Bush administration, said the US military was in favour of extending the new start treaty in part because its verification clauses provided a lot of information about the Russian arsenal.

"There is a deal to be had which many people, including myself, think would be in the US national interest. The question is – is the president going to get there?" he asked.

Trump, Bolton and Tim Morrison, a senior arms control official on the national security council, have all been fervent critics of new start. The treaty was seen by Barack Obama as one of his most important foreign policy achievements.

Russian state media have highlighted the upcoming talks and the Kremlin released photographs of Putin prepping Patrushev during a security council meeting in Russia earlier this week. "We're going to give a lot of suggestions, which I expect they'll take under consideration," the security official said on Wednesday.

Patrushev, who ran the FSB and has known Putin for decades, is a powerful member of the Russian establishment. Like Bolton, he is also known for hawkish, controversial statements.

Russia would also like to see greater collaboration over Syria. Trump's desire to claim victory over Islamic State and withdraw the 2,000 US troops in the country potentially offers common ground with Moscow. But it clashes with another Trump priority – to counter Iranian influence in Syria.

Michael Carpenter, a former deputy assistant secretary of defence in the Obama administration, said: "Ever since my time at the Pentagon, the Russians have desperately wanted military-to-military talks on the situation in Syria and they have consistently misrepresented our very narrowly scoped deconfliction channel as being more than it is.

"They obviously want that greater set of talks about collaboration in Syria, which would [be] totally foolhardy for the US to enter into, because we would be basically partnering Russia's partners in Syria, who are Iran and Hezbollah. And we don't want anything to do with that and we should stay well clear of it."

Bolton and Patrushev would also discuss Ukraine, state media said, although there is little sign of movement on this issue. Earlier this week, the Kremlin denied that Putin and Trump had discussed the possibility of sanctions relief in exchange for Russian concessions on the conflicts in Syria and Ukraine.

Wireless Communication Breaks Through Water-Air Barrier

Matt Matheson, MIT News Office, August 22

MIT researchers have taken a step toward solving a longstanding challenge with wireless communication: direct data transmission between underwater and airborne devices.

Today, underwater sensors cannot share data with those on land, as both use different wireless signals that only work in their respective mediums. Radio signals that travel through air die very rapidly in water. Acoustic signals, or sonar, sent by underwater devices mostly reflect off the surface without ever breaking through. This causes inefficiencies and other issues for a variety of applications, such as ocean exploration and submarine-to-plane communication.

In a paper being presented at this week's SIGCOMM conference, MIT Media Lab researchers have designed a system that tackles this problem in a novel way. An underwater transmitter directs a sonar signal to the water's surface, causing tiny vibrations that correspond to the 1s and 0s transmitted. Above the surface, a highly sensitive receiver reads these minute disturbances and decodes the sonar signal.

"Trying to cross the air-water boundary with wireless signals has been an obstacle. Our idea is to transform the obstacle itself into a medium through which to communicate," says Fadel Adib, an assistant professor in the Media Lab, who is leading this research. He co-authored the paper with his graduate student Francesco Tonolini.

The system, called "translational acoustic-RF communication" (TARF), is still in its early stages, Adib says. But it represents a "milestone," he says, that could open new capabilities in water-air communications. Using the system, military submarines, for instance, wouldn't need to surface to communicate with airplanes, compromising their location. And underwater drones that monitor marine life wouldn't need to constantly resurface from deep dives to send data to researchers.

Another promising application is aiding searches for planes that go missing underwater. "Acoustic transmitting beacons can be implemented in, say, a plane's black box," Adib says. "If it transmits a signal every once in a while, you'd be able to use the system to pick up that signal."

Decoding vibrations

Today's technological workarounds to this wireless communication issue suffer from various drawbacks. Buoys, for instance, have been designed to pick up sonar waves, process the data, and shoot radio signals to airborne receivers. But these can drift away and get lost. Many are also required to cover large areas, making them impracticable for, say, submarine-to-surface communications.

TARF includes an underwater acoustic transmitter that sends sonar signals using a standard acoustic speaker. The signals travel as pressure waves of different frequencies corresponding to different data bits. For example, when the transmitter wants to send a 0, it can transmit a wave traveling at 100 hertz; for a 1, it can transmit a 200-hertz wave. When the signal hits the surface, it causes tiny ripples in the water, only a few micrometers in height, corresponding to those frequencies.

To achieve high data rates, the system transmits multiple frequencies at the same time, building on a modulation scheme used in wireless communication, called orthogonal frequency-division multiplexing. This lets the researchers transmit hundreds of bits at once.

Positioned in the air above the transmitter is a new type of extremely-high-frequency radar that processes signals in the millimeter wave spectrum of wireless transmission, between 30 and 300 gigahertz. (That's the band where the upcoming high-frequency 5G wireless network will operate.)

The radar, which looks like a pair of cones, transmits a radio signal that reflects off the vibrating surface and rebounds back to the radar. Due to the way the signal collides with the surface vibrations, the signal returns with a slightly modulated angle that corresponds exactly to the data bit sent by the sonar signal. A vibration on the water surface representing a 0 bit, for instance, will cause the reflected signal's angle to vibrate at 100 hertz.

"The radar reflection is going to vary a little bit whenever you have any form of displacement like on the surface of the water," Adib says. "By picking up these tiny angle changes, we can pick up these variations that correspond to the sonar signal."

Listening to "the whisper"

A key challenge was helping the radar detect the water surface. To do so, the researchers employed a technology that detects reflections in an environment and organizes them by distance and power. As water has the most powerful reflection in the new system's environment, the radar knows the distance to the surface. Once that's established, it zooms in on the vibrations at that distance, ignoring all other nearby disturbances.

The next major challenge was capturing micrometer waves surrounded by much larger, natural waves. The smallest ocean ripples on calm days, called capillary waves, are only about 2 centimeters tall, but that's 100,000 times larger than the vibrations. Rougher seas can create waves 1 million times larger. "This interferes with the tiny acoustic vibrations at the water surface," Adib says. "It's as if someone's screaming and you're trying to hear someone whispering at the same time."

To solve this, the researchers developed sophisticated signal-processing algorithms. Natural waves occur at about 1 or 2 hertz — or, a wave or two moving over the signal area every second. The sonar vibrations of 100 to 200 hertz, however, are a hundred times faster. Because of this frequency differential, the algorithm zeroes in on the fast-moving waves while ignoring the slower ones.

Testing the waters

The researchers took TARF through 500 test runs in a water tank and in two different swimming pools on MIT's campus.

In the tank, the radar was placed at ranges from 20 centimeters to 40 centimeters above the surface, and the sonar transmitter was placed from 5 centimeters to 70 centimeters below the surface. In the pools, the radar was positioned about 30 centimeters above surface, while the transmitter was immersed about 3.5 meters below. In these experiments, the researchers also had swimmers creating waves that rose to about 16 centimeters.

In both settings, TARF was able to accurately decode various data — such as the sentence, "Hello! from underwater" — at hundreds of bits per second, similar to standard data rates for underwater communications. "Even while there were swimmers swimming around and causing disturbances and water currents, we were able to decode these signals quickly and accurately," Adib says.

In waves higher than 16 centimeters, however, the system isn't able to decode signals. The next steps are, among other things, refining the system to work in rougher waters. "It can deal with calm days and deal with certain water disturbances. But [to make it practical] we need this to work on all days and all weathers," Adib says.

The researchers also hope that their system could eventually enable an airborne drone or plane flying across a water's surface to constantly pick up and decode the sonar signals as it zooms by.

The research was supported, in part, by the National Science Foundation.

The Navy Is Building a New Ballistic Missile Submarine That Is Truly Stealth

Kris Osborn, The National Interest, August 19

The Columbia-Class, to be operational by the 2028, is a new generation of technically advanced submarines intended to quietly patrol the undersea realm around the world to ensure second-strike ability should the U.S. be hit with a catastrophic nuclear attack.

Columbia-Class is a new generation of submarines intended to quietly patrol the undersea realm around the world.

The Navy has now issued at least one-fourth of the design work and begun further advancing work on systems such as a stealthy "electric drive" propulsion system for the emerging nuclear-armed Columbia-Class ballistic missile submarines by 2021.

"Of the required design disclosures (drawings), 26-percent have been issued, and the program is on a path to have 83-percent issued by construction start," Bill Couch, spokesman for Naval Sea Systems Command, told Warrior Maven.

The Columbia class is to be equipped with an electric-drive propulsion train, as opposed to the mechanical-drive propulsion train used on other Navy submarines.

In today's Ohio-class submarines, a reactor plant generates heat which creates steam, Navy officials explained. The steam then turns turbines which produce electricity and also propel the ship forward through "reduction gears" which are able to translate the high-speed energy from a turbine into the shaft RPMs needed to move a boat propeller.

"The electric-drive system is expected to be quieter (i.e., stealthier) than a mechanical-drive system," a Congressional Research Service report on Columbia-Class submarines from earlier this year states.

Designed to be 560-feet– long and house 16 Trident II D5 missiles fired from 44-foot-long missile tubes, Columbia-Class submarines will use a quieting X-shaped stern configuration.

The "X"-shaped stern will restore maneuverability to submarines; as submarine designs progressed from using a propeller to using a propulsor to improve quieting, submarines lost some surface maneuverability, Navy officials explained.

Navy developers explain that electric-drive propulsion technology still relies on a nuclear reactor to generate heat and create steam to power turbines. However, the electricity produced is transferred to an electric motor rather than so-called reduction gears to spin the boat's propellers.

The use of an electric motor brings other advantages as well, according to an MIT essay written years ago when electric drive was being evaluated for submarine propulsion.

Using an electric motor optimizes use of installed reactor power in a more efficient way compared with mechanical drive submarines, making more on-board power available for other uses, according to an essay called "Evaluation and Comparison of Electric Propulsion Motors for Submarines." Author Joel Harbour says that on mechanical drive submarine, 80-percent of the total reactor power is used exclusively for propulsion.

"With an electric drive submarine, the installed reactor power of the submarine is first converted into electrical power and then delivered to an electric propulsion motor. The now available electrical potential not being used for propulsion could easily be tapped into for other uses," he writes.

Research, science and technology work and initial missile tube construction on Columbia-Class submarines has been underway for several years. One key exercise, called tube-and-hull forging, involves building four-packs of missile tubes to assess welding and construction methods. These structures are intended to load into the boat's modules as construction advances.

"Early procurement of missile tubes and prototyping of the first assembly of four missile tubes are supporting the proving out of production planning," Couch said.

While the Columbia-Class is intended to replace the existing fleet of Ohio-Class ballistic missile submarines, the new boats include a number of not-yet-seen technologies as well as different configurations when compared with the Ohio-Class. The Columbia-Class will have 16 launch tubes rather than the 24 tubes current on Ohio boats, yet the Columbias will also be about 2-tons larger, according to Navy information.

The Columbia-Class, to be operational by the 2028, is a new generation of technically advanced submarines intended to quietly patrol the undersea realm around the world to ensure second-strike ability should the US be hit with a catastrophic nuclear attack.

Formal production is scheduled for 2021 as a key step toward fielding of a new generation of nuclear-armed submarines to serve all the way into and beyond the 2080s.

General Dynamics Electric Boat has begun acquiring long-lead items in anticipation of beginning construction; the process involves acquiring metals, electronics, sonar arrays and other key components necessary to build the submarines.

Both the Pentagon and the Navy are approaching this program with a sense of urgency, given the escalation of the current global threat environment. Many senior DoD officials have called the Columbia-Class program as a number one priority across all the services.

"The Columbia-Class submarine program is leveraging enhanced acquisition authorities provided by Congress such as advanced procurement, advanced construction and multi-year continuous production of missile tubes," Couch added.

N-Capable Sub-Launched Missile Operationalised, India In Select Triad Club

Hemant Kumar Rout, New India Express, August 20

Making its mark as a military superpower in the Southeast Asia region, India has finally operationalised its first home-grown nuclear capable Submarine Launched Ballistic Missile (SLBM), after nearly two decades of its development. This makes India the sixth in the world to have a credible triad of nuclear-enabled missiles that can be fired from land, air and undersea.

Kept under wraps for years and inducted in the Navy a couple of months ago, the SLBM, code-named 'B-05', was secretly test-fired back-to-back from indigenously-built nuclear-powered submarine INS Arihant off the Vizag coast on August 11 and 12. An official associated with the mission on Sunday told TNIE three rounds of the world-class missile were tested during the first-phase user trial and it was a roaring success. Two tests were conducted on August 11, and one was done the next day.

All three missiles were fired from the submarine, nearly 20-m deep in the sea, about 10-km off the Vizag coast. It perfectly followed the pre-designated trajectory before zeroing in on the target with high accuracy, reaching close to zero circular error probability," the official confirmed over the phone from New Delhi.

Fire Power

Operational range -750 km
Length - 10 metre
Width - 1 metre
Weight - 10 tonne
Warhead - 1,000 kg
Engine - Two-stage solid-fuelled
Best in this class in the world
Not easy to be tracked and destroyed by enemies

PH to Buy Submarines From Russia Despite US Warning

Antonio L. Colina IV, Minda News, August 19

DAVAO CITY — The Philippines will buy submarines from Russia despite the warning issued by a US defense official not to acquire military hardware from Russia, President Rodrigo Duterte said.

Duterte criticized the US for interfering in the country's plan to get submarines from Russia to modernize the navy during a speech at the mass oath-taking of barangay officials in the regional political party Hugpong ng Pagbabago (HNP) at the SMX Convention Center Davao on Friday.

He said the neighboring countries of the Association of Southeast Asian Nations (ASEAN) neighbors own submarines, citing Vietnam with seven; Malaysia, two, and Indonesia, eight.

Duterte said he wants to meet the US officials in a forum to hear from them why they oppose the Philippines' plan to buy submarines from Russia.

"You state your case why you are against my country acquiring submarines. Give me the reason why and make it public. You want us to remain backward," he said.

"Not helpful"

The Manila Times quoted Schriver as telling reporters in a roundtable discussion at the US Embassy in Manila last Thursday that the Philippines "should think very carefully" about purchasing equipment from Russia because "I don' think that is a helpful thing to the alliance."

"Ultimately, I think we can be a better partner than the Russians can be to the Philippine people," he said.

The Philippine Star quoted Defense spokesperson Arsenio Andolong as saying the Philippine government is acquiring military equipment from any country where it will be beneficial and advantageous to the Armed Forces of the Philippines.

"While our acquisition of submarines (from Russia) for the Philippines is still under study and nothing is final at this point, we emphasize that the defense department will procure equipment that is most advantageous for the AFP through the AFP Modernization Program," Andolong said.

Andolong also said the DND is not limiting its choices to Russiia and is also considering France and South Korea as possible sources for the Navy's first submarine.

"What's the problem?"

"Why, what's the problem about acquiring submarines?" Duterte asked.

He said the country wants to acquire submarines to boost the military capabilities and not use them against the US or China amid the tension in the West Philippine Sea.

Duterte was also displeased by the sale of six refurbished helicopters from the North Atlantic Treaty Organization (NATO) by the US government to the Philippines.

"Did you investigate that two or three of them crashed already? The latest was in Lipa. Kaka-take off lang, bumagsak, pumutok. Galing sa inyo 'yun (It had just taken off when it crashed and exploded). No, no, I'm not your enemy. I'm protecting my soldiers and police," he said.

"Is that the way how you treat an ally? And you want us to stay with you for all times? Think about it. Why did you not stop the other countries the — Asia? Bakit kami pinipigilan ninyo? (why are you stopping us?)"

He said all the military equipment the Philippines obtained from the US were not free and only South Korea, Japan, China, and Russia donated to the Philippines.

China Is Building a Fleet of Autonomous AI-Powered Submarines. Here Are the Details

Marc Prosser, Singularity Hub, August 15

A fleet of autonomous, AI-powered submarines is headed into hotly-contested Asian waterways. The vehicles will belong to the Chinese armed forces, and their mission capabilities are likely to raise concerned eyebrows in surrounding countries.

According to the South China Morning Post (SCMP), the submarines will be able to carry out "[…] a wide range of missions, from reconnaissance to mine placement to even suicide attacks against enemy vessels."

If all goes to plan, the first submarines will launch in 2020.

New Non-Nuclear Threat

While details of the project remain sparse, one unnamed scientist told the SCMP that the submarines "will not be nuclear-armed."

The onboard AI systems will be tasked with making decisions on course and depth to avoid detection as well as identifying any craft they come across. One area that has caused some concern is whether the submarines' AI systems are being designed to not seek input during the course of a mission. In other words, if they will be left to make decisions such as whom to attack.

While there is some light to be had trying to find a name for the submarines' capabilities (self-swimming?), China's neighbors will likely be anything but amused by the news. The subs will likely patrol areas in the South China Sea and the Pacific Ocean. Both are contested waters where China and countries like Japan and Vietnam disagree as to who holds the rights to various resource-rich areas and islands. Recently, the Chinese military created artificial islands in the area to use as military bases.

The country's robotic submarines could be seen as a further escalation of the situation.

Regional unease may be intensified by the fact that AI vessels would be able to learn from similar craft. In other words, the submarines would be able to engage in continuous strategic adjustment and development, should they come to be deployed in a conflict.

The Robot Sea Battle

This is not the only military project involving autonomous vessels at sea. Lin Yang, marine technology equipment director at the Shenyang Institute of Automation, Chinese Academy of Sciences, told the SCMP that the Chinese development project had been launched in part because of similar measures undertaken by the US.

Earlier this year, DARPA handed the ASWACTUW (short for Anti-Submarine Warfare Continuous Trail Unmanned Vessel) experimental craft over to the US Navy. Once fully developed, the "Sea Hunter," as it's (thankfully) also known, will be able to carry out autonomous missions for up to three months at a time.

The US is also working with major defense contractors on two prototype autonomous submarine systems, coincidentally set to be ready by 2020: Lockheed Martin's Orca system and Boeing's Echo Voyager.

The Murky Waters Of AI Warfare

These developments add further fuel to the fiery debate surrounding the use of AI-driven weapons systems. In the case of the submarines, questions include what would happen if they were to potentially go rogue or become compromised, leading them to attach to the wrong goals.

As Jim Mattis put it in an interview about the use of AI and drones in warfare, "If we ever get to the point where it is completely on automatic pilot, we are all spectators. That is no longer serving a political purpose. And conflict is a social problem that needs social solutions, people—human solutions."

Many echo such sentiments, and fear humans may be getting subtracted out of this particular equation. It is a worry that resounds within the AI industry, with dozens of CEOS—including Elon Musk—signing an open letter to the UN urging a ban on AI-powered weapons.

"Lethal autonomous weapons threaten to become the third revolution in warfare. Once developed, they will permit armed conflict to be fought at a scale greater than ever, and at timescales faster than humans can comprehend. These can be weapons of terror, weapons that despots and terrorists use against innocent populations, and weapons hacked to behave in undesirable ways. We do not have long to act. Once this Pandora's box is opened, it will be hard to close," the letter warns.

'You're one beer away from Navy Times!' Inside a legendary submariner bar.

Geoff Ziezulewicz, Navy Times, August 11

BREMERTON, Wash. — What happens to the things they carried?

The memories, the stories, the mementoes that submariners collect during their long months under the sea? Things only fellow shipmates would consider priceless?

For retired Torpedoman 1st Class Larry Timby, the personal and unit items shared — and sometimes pocketed along the way — follow a certain theme.

"When you first get out of the military, you have your plaques and your awards, and you hang them in your house," Timby said. "They call it their 'I Love Me' wall."

But over the years, he said, things change.

"The wife or the girlfriend doesn't want to see it on the wall anymore," he said. "And when you downsize or move, what do you do with it?"

Sure, some stuff gets packed in a box and forgotten. But over the years, many submariners have opted to send their stuff to the Horse & Cow, perhaps the most legendary submariner bar on the planet.

Part cozy dive, part museum, the Horse & Cow's location in downtown Bremerton stands as an homage to the silent service, a monument that you can drink in.

On the bar's bukheads swim the history of the American submariner, through items meaningful not only to the sailors who donated them but also the crews that recognize the artifacts when they spot them.

On one wall hangs what's believed to be the original canvas banner from the Nautilus, America's first nuclear-powered submarine launched in 1954, four years before she dove under the North Pole.

Another wall features a box of three military-issue knives, given to the tavern by a retired Navy SEAL who'd rather have them displayed here than languish in an attic trunk.

Overhead, attached to a USS Horse & Cow (SSN 333 1/3) sail, the eyes find a pair of Texas longhorns. They went underway aboard the now-decommissioned submarine Houston.

The tattered American flag that flew on the sub's final tour is framed on another wall, a present from the boat's last commander.

Walls are pocked in plaques and original World War II Walt Disney drawings of submarine insignia. Everywhere are banners and sideboards and probes and engine room throttle wheels, gadgets and gear looted by submariners over the years that ended up here.

When Navy Times visited, Timby proudly showed off their latest trophy: a sideboard from the submarine Bremerton, a boat on its way to being decommissioned after 37 years of service.

And then there's a plaque from the Scorpion, a sub that sank under mysterious circumstances in 1968, killing 99 crewmen. A POW-MIA flag is draped nearby to remember them.

"I think it was a Cold War incident," said Timby, disputing the semi-official explanation that an accidental torpedo explosion crushed the boat's hull.

He thinks the Soviets sank her.

A yellowing bar biography on the wall explains that the name "Horse & Cow" stems from Poseidon, the Greek god of the sea, who's often portrayed accompanied by a small horse and a small cow, or bull.

During the world wars, "merchant sailors, terrified of being sunk by submarines, tattooed a horse on one ankle, a cow on the other, in hopes of ensuring safe passage," the bio states.

It might be an architectural homage to the silent service, but the bar and restaurant also brims with sailors, Puget Sound Naval Shipyard hands, military veterans of all stripes and assorted Bremerton regulars.

One recent Friday night, waitresses passed out shots of "Nuke Waste," a schnapps-like drink invented by Mike Looby, the founder and owner of the Horse & Cow's Bremerton outpost.

When everyone has a shot of the bright green victual in front of them, the girls sound a klaxon behind the bar and everyone drinks.

Earlier this year, Attorney General Jeff Sessions gingerly sipped a shot while visiting the Horse & Cow with his son-in-law, a Navy submariner.

Looby said he had to gently goad the Alabama Republican into taking a sip.

"A lot of these old guys come in off the old boats, the diesel boats," said Timby, who became co-owner of the bar a few years ago after spending years as one of Looby's most loyal customers. "They have their reunions here. They see stuff and they light up."

That's because at the Horse & Cow, submariners, their boats and their buddies are never forgotten.

"There's a lot of things that just fade away," Timby said. "But as long as we're here, we'll always be remembered."

"It wasn't about the money"

Sipping a cocktail, Looby is decidedly coy about how his watering hole came to hold so many submarine treasures.

"How we acquired everything is a mystery," Looby said.

But he's acquired a lot. His 5,000-square-foot Horse & Cow in Guam, another U.S. submarine hub, displays other keepsakes. Spillover collectibles are stored away, perhaps destined one day for outlets in Groton, Connecticut, and Pearl Harbor.

"Everything's original, we never paid for anything," he said. "Some of the stuff came under the cuff, some of the stuff by captains."

Some of it first landed in the hands of his father, the late Jimmy "The Godfather" Looby. An Army vet, he founded the first Horse & Cow in 1953 with his brothers in San Francisco.

Back then, surface warfare guys or civilians risked their butts daring to enter a submariner bar, but times have changed.

"If you brought something of value from the submarine and we put it up in the bar, it was open tap," Looby recalled. "Beer, booze, food, whatever was available, and it was just given to the guys, and it wasn't just a onetime thing."

Pier 39 actually had boats tied up there. After a Defense Department round of base closures shuttered the waterfront, Jimmy Looby moved his operation to an area near Hunters Point Naval Shipyard in San Francisco.

When another round of consolidations scuppered that location, The Godfather relocated to Mare Island Naval Shipyard in Vallejo, northeast of San Francisco.

"You're there to make money, but it wasn't about the money," Looby said. "In Vallejo, when I was working for my father, I know for a fact we gave away more booze than most bars in that town sold."

When that base shut down, the Looby operation again shifted, this time to Bremerton, but The Godfather was done by then and his son had taken the helm, launching the Puget Sound outpost in 2000.

"Things I shouldn't have"

Timby and Looby have an obvious affection for the submariner artifacts sailors have entrusted to them over the years. And some of the items submariners have smuggled to them are borderline bonkers.

Once while working with his dad in Vallejo, "we had non-charged reactor rods," Looby said.

They also have an undisclosed number of primary valve cap covers from submarines, known in their post-service lives as the "Horse & Cow chalice."

If you don't know what a primary valve cap cover is, you're probably not a submariner.

But after a primary valve cap cover's retirement, barkeeps will pour a bottle of Nuke Waste into one of the caps and pass it around.

"Back in the nuke room, somewhere back aft, near the nuke room, they have this in the engine room," Timby said. "That's all I'm gonna say about it."

"Those are highly controlled," Looby added. "I've got quite a few of those, and when those come to me…I don't know where it came from. I don't ask questions. I don't care."

Sometimes, buttoned-up officers come into the bar, demanding to know who gave Looby his latest memento, but he said he'll always protect his sources from the squares.

"There's some officers out there that everything is by the book," he said. "Things show up and they're out of their mind when they see it here."

Sometimes they raise hell, Looby said, but nothing comes of it.

"If it ends up at the Horse & Cow, it's at the Horse & Cow," he said. "You can come look at it anytime, but it's at the Horse & Cow."

Sometimes things even move through official channels. The guys recently acquired two seats off the fast-attack submarine Albuquerque, which was decommissioned last year.

"Official paperwork and everything," Timby said.

"For the most part, it's drama free, but there are some things I get that I don't want to boast about," Looby said.

"You're one beer away from Navy Times!"

Looby is sometimes wistful for the old Navy days, when everything wasn't so sanitized and politically correct. At the same time, he doesn't swab up as much puke or stop as many fights as he did back in the day. In fact, today's junior enlisted kids look out for each other.

"There's always at least one designated driver and they're always making sure everybody has a ride home," Timby said.

If some of the younger guys are really putting them back, Looby asks how they're getting home, and the designated driver always raises his hand.

"He's the one sitting there going, 'I gotta sit here with all these drunk bastards and deal with them?'" Looby said.

From Guam to Bremerton and at several points in between, Looby has tipped back too many drinks to count, sipping with every rank from seaman to admiral.

He's even gotten straight twisted with some flag officers, and recounted stories not fit for print.

"I always remind them, 'Hey man, you're one beer away from Navy Times!" Looby said.

One sea story starts "in a land far, far away, in an undisclosed location" outside the United States.

"There was this admiral friend of mine," Looby recalled. "We were hosting a boat from another country. It becomes a challenge to get them drunk. The foreign dignitary's going to drink us under the table, or we're going to drink them under the table."

The battle commenced at about 4 p.m., and by 2 a.m., everyone was legless.

"I don't want to hang anybody, but by that time, he was speaking 'drunkanese,'" Looby said of the anonymous admiral. "I don't think he even knew his own name, snot running from his nose."

Eventually, the duty drivers for the foreign commanders arrived.

"Their captain and their commodore finally staggered out the door and that's how it ended," Looby said. "And we staggered out ourselves."

Looby knows all the boats, and all the crews, even submariners who arrive in Bremerton years after they got out, just to belly up again at the bar.

"We picked up where we left off, like we haven't missed a single day or a single story," Looby said. "The rumors. He thought I was dead, I thought he was dead. But we're sitting here, drinking beer."

Submarines in the South China Sea Conflict

Tyler Headley, The Diplomat, August 10

Five weeks ago, it was announced that Australia finalized a $25 billion-dollar order of anti-submarine frigates from Britain's BAE Systems. This purchase is the latest procurement of heavy weaponry threatening to stir up the South China Sea territorial dispute.

Since 1991, five of seven countries with a claim to islands or water in the South China Sea have purchased at least one attack submarine, and all five countries that have begun or announced freedom of navigation missions in the South China Sea possess submarines. As the danger of submarines in the South China Sea has grown, countries like Australia have responded by further investing in either submarines or anti-submarine equipment.

The history of submarine usage in combat dates to the American War of Independence when the "Turtle" submersible attempted to plant a bomb on a British flagship. Since then, attack submarines have since been used to disrupt trade routes, secretly deploy troops, and dodge enemy lines to gain an element of surprise. A necessary tool in interstate warfare, submarines have been used to great effect, such as when German U-Boats in World War I sank an estimated 5,000 ships.

The South China Sea is notable for the nearly $5 trillion dollars of annual global trade passing through its waters, billions of tons of crude oil, and a strategic location, potentially serving as an easy point for Chinese submarines to access the Pacific Ocean. While smaller territorial conflicts in the South China Sea have existed since the 1970s, the conflict has seen increasing movement and attention since about 2010, as China began building artificial islands at a greatly expedited rate.

Part of this construction endeavor included building the Yulin-East Chinese submarine base. Maintaining a submarine presence in the region is important to China; already in the South China Sea dispute, submarines have been used for gathering intelligence, projecting power, and deterring hasty military engagement. If ever war should break out, active submarines in the area could prove the difference in the outcome of the conflict. Because of this, it is important to understand the scope and extent of submarine proliferation, especially those possessed by states with a claim to islands or area within the South China Sea.

One issue when analyzing the proliferation of submarines in the South China Sea conflict is that there is no centralized and complete open-source registry of submarine procurements. To ameliorate the uncertainty, I amalgamated data from the Stockholm International Peace Research Institute, the Nuclear Threat Initiative, and other open sources to compile a dataset of almost all direct submarine transactions between relevant parties.

When plotting the claimant states' submarine procurement networks since 1991, three distinct networks emerge.

Most notably, Russia has supplied both China and Vietnam, which have competing claims in the South China Sea, with submarines. Around 2014, Vietnam ordered about six Kilo-class submarines from Russia, of the same vein as the eight diesel-electric Kilo-class submarines that China ordered in 2002. And as reported by The Diplomat, the Philippines, another claimant country involved in the South China Sea dispute, has recently made news for potentially seeking to procure submarines from Russia as well. While China has indigenous production capabilities, boasting Jin-class nuclear submarines in its naval arsenal, other countries possess similar non-nuclear submarines just by procuring from the same developer.

Since World War II, China has been the largest procurer of submarines, ordering more than 35. This total, however, does not include its indigenously-produced submarines. Some submarines have been retired over time, but it appears like the Chinese submarine fleet includes 48 operational diesel submarines, and 10 to 13 nuclear submarines. Indonesia also boasts a large submarine fleet – while Indonesia operates far fewer submarines now than it did during the 1960s and 1970s, it currently maintains a fleet of five submarines and has announced a plan to increase its fleet to eight by 2024.

The claimant states' submarines aren't the only ones in play: the United States, Japan, Australia, United Kingdom, and France have all begun or announced freedom of navigation operations in the South China Sea. These patrols are aimed at curtaining China's reach and bolstering support for allies in the region. The large number of state parties, however, increases the chance of an accident or provocation. Forays into China's claimed exclusive economic zone have already drawn the ire of Chinese state and military officials. And accidents have occurred, such as the collision of a Chinese submarine with a U.S. sonar array in 2009.

The destructive potential of submarine proliferation in the South China Sea is clear to military observers, and states have begun preparing accordingly. The United States and Japan in March began conducting anti-submarine warfare drills, and China has notably been planting underwater listening devices in hopes of keeping track of other countries' submarines.

Even with these preventative measures, however, the heavy weapons buildup, including Australia's recent order of anti-submarine frigates, is likely to continue. If tensions rise, it is possible that we will see continued submarine procurements by the claimant states: Brunei, China, Taiwan, Malaysia, Indonesia, the Philippines, and Vietnam.