

**MINUTES OF THE USSVI NORTHERN VIRGINIA BASE
MEETING HELD ON SATURDAY, Aug 12, 2017**

The Base CDR, Chuck Martin, called the meeting to order at 1105 on Aug 12, 2017, at the American Legion Post 162, Lorton, VA. and welcomed all members.

MEMBERS AND GUESTS IN ATTENDANCE

Steve Bishop, Howard Chatham, Ed Ettner, Mary Ettner, Mickey Garverick, Steve Jaeger, Chuck Martin, Mike Naughton, Mary Lou Naughton, Paul Nelson, Terry Nelson, Tim Oliver, Joe Phoenix, Mike Varone, Penny Wallace, George Wallace, and Woody Woodworth. (17 total)

■ Holland Club Member

■ Associate Member

■ Guest

The COB, Mike Varone, led all hands in the Pledge of Allegiance.

The Base Chaplain, Steve Jaeger, delivered the Invocation.

After a moment of silence, the CDR read the list of boats lost in the month of August. These were:

USS Bullhead (SS-332)	Aug 6, 1945
USS Flier (SS-250)	Aug 13, 1944
USS S-39 (SS-144)	Aug 13, 1942
USS Harder (SS-257)	Aug 24, 1944
USS Cochino (SS-345)	Aug 26, 1949

The Ship's Bell was rung twice for the twenty-two (22) USSVI NOVA Base members on Eternal Patrol.

IN MEMORIAM: Submarine sailors recently departed on Eternal Patrol are: FTB1(SS) Richard Lowry, USN Veteran; CAPT Terrence Joseph Camilleri, USN, Ret; and Admiral Powell F. Carter, Jr., USN, Ret.

MEETING MINUTES

The minutes of the June meeting were distributed by e-mail. There was no base meeting in July as we held the informal Dining Out / submarine movie review at Neighbor's Restaurant in Vienna. The June minutes were accepted.

TREASURER'S REPORT

The Treasurer, Steve Jaeger, presented the following:

Starting balance: \$ 9,440.40

Receipts \$ 356.79

Expenditures \$ 268,21

Ending balance: \$ 9,528.98, as of August 12, 2017

Some of these funds (\$ 3,365.84) were specifically funded by, and are restricted for use by, our Base's Kap(SS) 4 Kid(SS) program, as a result of our Walmart stores' Community Fund Donations. Subtracting these fenced funds yields:

Grand Total (discretionary) \$ 6,163.14

COMMITTEE REPORTS

EXECUTIVE BOARD

CDR: Board of Directors meeting was held August 2nd and discussed:

- Membership
- Committee reports
- Plans for upcoming meetings and events
- K4K status and plans
- Updates to the website
- USSVI National Convention, and
- Eagle Scout program

VCDR: Nothing to Report (NTR)

CHIEF OF THE BOAT: NTR

MEMBERSHIP REPORT: Steve Jaeger reported:

- 82 Members
- 40 Holland Club Members with 3 WW II Members
- 32 Regular Members
- 10 Associate Members

PAO: Mike Varone reported on:

- The successful Dale City 4th of July Parade. Members attending were: Steve Bishop, Howard Chatham, Chuck Martin, Mike Naughton, Tim Oliver, and Mike Varone.
- His continued pursuit of the USSVI Highway naming initiative with Prince William County.
- While attending the Ceremony for the Navy Memorial's "Year of the Master Chief Petty Officer of the Navy" (MCPON), Mike met the current MCPON and discussed with him the Holland Club ceremony at USSVI NOVA base. The MCPON is very interested in being our guest speaker in May, 2018 for next year's Holland Club Induction ceremony. Details are being coordinated with the MCPON's staff.

SK: Howard Chatham reported:

- Please let Howard know if you desire a 2018 USSVI calendar so he can put in a combined order at the Convention next month.
- Base patches and stickers of several types are available.

K4K: Steve Bishop reported:

- Our recent visits were to Walter Reed National Medical Center in Bethesda, MD on Thursday, June 15th and Fairfax INOVA in Falls Church, VA on Thursday, July 13th.
- Our next visits are to:
 - o Walter Reed National Medical Center in Bethesda, MD on Thursday, August 17th at 10:00 AM (battle rhythm is now the third Thursday, four times each year at Walter Reed). Howard will lead this visit as Steve has to miss this visit, our 30th hospital visit since July, 2010.

- UVA in Charlottesville, VA on Tuesday, September 26th at 1 PM
- For planning purposes, the National K4K Chair, John Riley, and the official USSVI Artist, Tom Denton, will both be joining us in November for our Walter Reed visit. This is the K4K visit when we plan to roll out our second K4K coloring book, which is aimed at the older children we visit. Tom Denton has created several less detailed submarine force action scenes specifically for this second coloring book.
- Our Base SK, Howard Chatham, has ordered our second tranche of K4K supplies this year. This recent order of over \$1300 will provide the inventory needed for the remaining planned 2017 visits, and it should last well into the 2018 visits.

CHAPLAIN: Steve Jaeger reported that Vickye Lowry sent a nice Thank You letter to Chuck Martin, our Base Commander, for his and the Base's support and attendance at Richard's recent funeral service and reception in Leesburg, VA. Steve read the letter aloud.

SCOUTING COORDINATOR: Chuck Martin reported:

- Recent Eagle Scout Courts of Honors were attended for:
 - Eagle Scout Daniel Wheatley of Troop 165 in Fredericksburg, VA on June 11, 2017
 - Eagle Scouts Caleb Mullenax, Daniel Mullenax, and Phillip Mullenax of Troop 162 in Upper Tract, WV on June 17, 2017
 - Eagle Scout Thomas Carl Davis of Troop 162 in Franklin, WV on July 15, 2017
 - Eagle Scout Ethan Carpenter of Troop 1648 in Lusby, MD on July 29, 2017 (His granddad served on two submarines and his family was very pleased at our participation in the Ceremony.)
 - Eagle Scout Daniel Hall of Troop 897 in Midlothian, VA on August 5, 2017.

SUBLEAGUE: Tim Oliver reported that several USSVI NOVA Base members will be voluntarily manning the NSL booth at the USSVI convention in Orlando. Chuck Martin reported:

- The Naval Historical Foundation and the Central Intelligence Agency will hold a seminar on the history of the Cold War Soviet Navy on 6 September 2017 at the Cold War Gallery of the Navy Museum in the Washington Navy Yard, from 4 to 6 pm. Register at: <https://www.eventbrite.com/e/red-navy-revealed-the-soviet-navy-intelligence-and-analysis-during-the-cold-war-tickets-36402743586>
- Other upcoming NSL Events are:
 - 2017 History Seminar October 31st – “The Hunt for Red October: Fact and Fiction” a panel discussion comparing a real Cold War submarine mission (which has been declassified) and the movie. This will be held at the United States Navy Memorial in Washington, DC
 - 35th Annual Symposium will be held November 1st – 2nd at The Hyatt Regency in Crystal City, VA

OLD BUSINESS

- The NOVA Base held our Annual Informal Dining Out in July instead of our regular Base meeting. The dining out was enjoyed by all who could make it to the Neighbors Restaurant in Vienna, VA.

- Contact either Steve Jaeger or the Base Commander if you would like to opt out of receiving the printed version of the American Submariner quarterly magazine and get the electronic version instead.

NEW BUSINESS

- The election results for the 2017-2018 North Eastern Region District Commanders are:
 - o Peter Koester D1 District Cmdr.
 - o Mike Bost D2 District Cmdr.
 - o Huey Dietrich D3 District Cmdr.
 - o Ronny Olson D4 District Cmdr.
 - o Jim Irwin D5 District Cmdr.
- 2018 USSVI NOVA Base Officers Election - Brian Haller is leading the 2018 Base Officer Nomination Committee. Brian and his team of Paul Nelson and Woody Woodworth may be calling you or emailing you in the near future to see if you are interested in being nominated for one of the 2018 Base Officer positions (Base Commander, Vice Commander, Treasurer, or Secretary). If you are able, please volunteer to be a nominee. As seen recently, USSVI National has had to disband some Bases due to the lack of members being willing to serve as a Base officer.
- USSVI National Convention (September 1-6, 2017) will be held at Rosen Shingle Creek Hotel, Orlando, Florida.
 - o Governor Rick Scott has signed a proclamation designating September 1 – 6, 2017 to be U.S. Submarine Veterans Appreciation Week in the State of Florida in honor of our National Convention and the 117th anniversary of the U.S. Submarine Service.
- A Go Fund Me website has been created for USS Ling (SS-297), a World War II-era submarine owned by the Submarine Memorial Association which runs the New Jersey Naval Museum in Hackensack, New Jersey, by Alan Bodie of the USSVI Blueback Base. All contributions made through the GoFundMe web site go directly to the Submarine Memorial Association – a qualified 501(c) (3) organization – and all donations are fully tax-deductible.
- As an alternative to the USSVI Highway Naming initiative, the BASE members in attendance were polled as to their interest in participating in the Adopt-A-Highway program.
 - o We would have to agree to pick up litter at least twice a year for three years on a two mile section of road.
 - o VDOT provides trash bags, vests, important safety information and highway signs that recognize you or your group.
 - o Signs erected after two pickups are documented.
 - o 13 of the 16 attendees raised their hands in support.
- Howard Chatham reported that he had contacted the Amphora Deluxe Restaurant in Herndon, VA (site of this year’s HC induction) to save the date for our next Holland Club Induction for May 12, 2018.

BINNACLE LIST

“PLEASE KEEP THE FOLLOWING IN YOUR PRAYERS.”

Al Anceravage, Linda Clement, Barbara Harmody, Steve and Darlene Jaeger for Darlene’s mom, and Tony Poblete.

FOR THE GOOD OF THE ORDER

The 50/50 raffle was won by Chuck Martin, who donated his winnings back to the Base treasury. Thank you, Chuck!!

BIRTHDAYS FOR THE MONTHS OF JULY AND AUGUST WERE/ARE: Steve Bishop, Frances Burke, Cathy Chatham, Jeff Curren, Bill Decker, Christine Gault, Robert Gilmore, Sue Maruzo, Frank Pasquinesi, Joe Phoenix, Lorraine Sargent, Jeanie Truslow, Mike Varone, and Bill Waylett.

THE NEXT REGULARLY SCHEDULED MEETING WILL BE ON SEPTEMBER 9TH AT AMERICAN LEGION POST 162, WITH A MEMBER APPRECIATION LUNCHEON AFTERWARDS AT DIXIE BONES BBQ IN WOODBRIDGE, VA.

The Benediction was delivered by the Chaplain.

The CDR adjourned the meeting at 11:42 AM .

After a short break, we conducted the USSVI NOVA Base semi-annual Pirate Auction.

Chuck Martin and George Wallace (Pirates in charge of the Booty) jointly conducted the Auction and a great time was had by all attendees. Special thanks go to Bruce Miller and Mickey Garverick for their generous donations. A grand total of \$1,006.00 was raised for the Base treasury– a record for our internal Pirate Auctions.

Below, Base Commander Chuck Martin displays two sailing ship prints up for bid.



Thank you to all who donated and/or contributed to the Auction's success!!

At the end of the auction, Amos from the American Legion Post 162 management team, invited all submarine veterans and their families to a Legion picnic at the Post on September 9th.

Meeting Minutes Respectfully Submitted by
Stephen C Bishop
Secretary, USSVI Northern Virginia Base

USSVI News

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NEWS-01: USSVI & Groton Base Legal Issues
Part 1 of 2. Scroll down for 2nd part

Submitted by: John Markiewicz on 6/15/2017

USSVI & GROTON BASE LEGAL ISSUES

A lot of rumors have been flying around that Groton Base is suing USSVI and that USSVI is refusing to communicate with Groton Base or let the USSVI membership know what is going on.

I can tell you at this time is that no lawsuits have been filed to date. Confidentiality of ongoing negotiations between Groton Base and USSVI have been observed by the USSVI Board on the advice of attorney, however, Groton Base leadership has insisted on going public with their issues and their version of what is going on, so the only story getting out is coming from Groton Base.

The issue is regarding Groton Base's refusal to continue to file the 1120 tax return with the IRS and with the State of Connecticut because, after nearly 50 years of filing, they have decided that it is illegal for them to continue to do so. They also argue that the EIN that they have been filing under is illegal because it is illegal for USSVI to have two EINs. However, the EIN they have been filing under is a Groton Base EIN and has not ever been a USSVI EIN. This resulted in my temporarily suspending the liquor license and the Groton Base Charter as an emergency matter until I could convene a meeting of the Board to decide on how we were going to handle the issue. After the Board met, within a few days, we immediately lifted the suspension on both the liquor license and the charter. The Board has been consulted and has approved every action taken by myself, the appointed committee to work on a settlement and the attorney.

Unfortunately, when USSVI first obtained their separate EIN and the 501(c)19 tax exempt status, back in the 80s, neither the newly tax exempt USSVI nor the Groton Base bothered to restructure the operation of the for-profit club & bar and continued to operate it under the Groton Base EIN as they had always done. That has continued for many years with both Groton Base claiming and USSVI believing that Groton Base owned the Clubhouse and Bar. It was discovered in 2013 that this was not the case and that USSVI not only owned the Clubhouse (a title search has been done by our attorney) but that the liquor license was also owned/backed by USSVI.

In order to protect the interests of USSVI and it's members a Memorandum of Understanding was drawn up to allow Groton Base to continue to operate the Clubhouse and Bar. Groton Base has since repudiated and the Memorandum of Understanding between USSVI and Groton Base for the operation of the Club and Bar null and void. This could leave USSVI totally responsible for the operation of the clubhouse and bar and totally liable for any problems/issues with running a Bar that we have virtually no control over.

A meeting with Groton Base earlier this year resulted in an agreement for USSVI to hire an attorney to get a legal opinion and that both sides would abide by the decision of the attorney. This was approved by the Board of Directors and we did obtain an attorney who specializes in Non-Profit Corporations, our attorney also has been consulting with an independent CPA and with a Corporate Tax Attorney to attempt to resolve the issues. This process is still ongoing.

Our attorney recommended that both USSVI and Groton Base request an extension on filing the 2016 taxes until this matter has been resolved. USSVI applied for and received an extension, Groton Base refused to request an extension and was advised that any penalties or interest accruing from their failure to file or request an extension would be on them. Their 1120 tax return is now delinquent and the resolution to that issue rests with the IRS.

Our attorney recommended that communications between Groton Base and USSVI should go through her so as to reduce or eliminate confrontations and also asked that both parties treat this with confidentiality until we reach an agreement. USSVI, until now, has complied with that request while Groton Base has insisted on sending out full notices by email and posting their letters on Facebook as well as other forums.

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NEWS-02: USSVI \$ Groton Base Legal Issues

Part 2 of 2

Submitted by: John Markiewicz on 6/15/2017

A settlement option offering to allow Groton Base to separately incorporate the Club House & Bar operation from USSVI and to transfer, if possible (they may need to get a totally new liquor license), the liquor license to that new corporation has been presented to Groton Base, which would give them what they have maintained for many years, full ownership of the Clubhouse and Bar Operation. It was also offered that we would sell the Building to the new corporation at a To Be Negotiated price, which would then remove USSVI from the ownership and all control of the Clubhouse and Bar operation. It was also stated that, if they accept the offer, we would arrange a meeting to work out the details at our attorney's office in Hartford, CT with them and their attorney. Groton Base has thus far not accepted the offer and has stated they have not decided whether they will meet with "The Lawyer" and that all meetings will be at the Clubhouse in Groton.

This is the current status of the Groton/USSVI legal issues. Anyone that has ever dealt with legal issues and attorneys know that it is a slow, expensive and time-consuming endeavor and that negotiations are preferably done in private between the parties and not by public forum. I will post the final results of any negotiations once they have been completed and ask you all to remain neutral and allow the legal process to take place without further inflaming the issues with rumors and innuendos that have little connection with the facts

JOHN MARKIEWICZ

USSVI NATIONAL COMMANDER

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NEWS-01: 2017 USSVI CONVENTION ALERT

Submitted by: John E. Markiewicz on 7/6/2017

We are rapidly approaching the cut-off date for making hotel reservations at the Rosen Shingle Creek Resort in Orlando, Florida. To date we have met only 54% of our Room Night Guarantee and as of the 27th of July we will have to reduce the Room Block or be liable for several thousands of dollars in unoccupied rooms. We will also face loses in our food and beverage guarantees should we not meet the minimums contracted.

If you are planning on attending the convention, we need you to make both your hotel and convention reservations as soon as possible in order to get the convention rate of \$105 a night and still be able to make reservations for the luncheons and/or banquets. If we have to reduce the contractual blocks and minimums to reduce our potential loses, before you make your reservations, you will face much higher room rates and the probability of sold out events.

As of June 26th only 122 members and 78 guests have been registered. With nearly 13,000 members this is very low and jeopardizes not only this convention, but conventions in the future since convention hotels look at the actual room nights used in previous conventions before they quote a rate. The fewer attending the higher the room rates for future conventions.

I know we all like to wait until the last minute to make reservations and commit our money for a convention and I am one of the worst offenders, however, the time to make your reservations is now. We are really looking forward to seeing as many of you as possible and having a great convention.

John Markiewicz

National Commander

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NEWS-01: USS Ling SS-297

Submitted by: William C. Andrea on 7/17/2017

From:

Les Altschuler, NE Region Director:

For those of you who follow the news (and even for those of you who don't), the plight of the museum boat USS Ling (SS-297) has been the subject of considerable media attention lately. From an article appearing in the Wall Street Journal on June 12th to a nationally featured broadcast on the Fox News Channel earlier this month, Ling has captured the attention of many across the nation who have proven willing and eager to help preserve and restore her. It also captured the attention of a single USSVI member (Alan Brodie, Secretary and Newsletter Editor of the Blueback Base in Portland, Oregon), who reached out to the Submarine Memorial Association in Hackensack, NJ which oversees operation of the New Jersey Naval Museum and USS Ling. Alan offered to organize a fundraising campaign to benefit USS Ling via the GoFundMe web site and in a little more than a month has successfully raised more than \$12,500 toward the campaign's \$100,000 goal.

Among the many who have contributed to this effort is Barry Wyatt, Commander of the Gold Country Base of USSVI in Folsom, California. Along with his generous contribution of \$100, Barry commented on the GoFundMe web site, "As Base Commander of the Gold Country Base of USSVI, I challenge all other [USSVI] Base Commanders to meet or beat my contribution." Apparently, Barry is throwing down the gauntlet to any Base Commander (or any USSVI member, for that matter) willing to accept his challenge.

If you'd like to participate in this effort, you may do so in one of two ways. You may contribute directly through the GoFundMe web site (<https://www.gofundme.com/uss-ling>), or through the USSVI Charitable Foundation using the link provided on the USSVI web site (<https://www.justgive.org/basket?acton=donate&ein=95-4830806>). If you choose to donate through the USSVI Charitable Foundation, please be sure to indicate your contribution is to be directed to the Submarine Museum Fund for the benefit of USS Ling (SS-297). Whichever method you choose, your contribution is fully tax-deductible.

Note: The preceding Broadcast is provided for information purposes only and does not constitute an endorsement or recommendation by the USSVI Board of Directors or the USSVI Charitable Foundation.

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NEWS-01: US SUBMARINE VETERANS WWII NATIONAL MEMORIAL WEST Submitted by: John E. Markiewicz on 8/9/2017

Set Your Personal Military Legacy in Stone ...or rather, in a beautifully engraved brick, when you join the Legacy Brick Project at the U.S. Submarine Veterans of WWII National Memorial, West, just outside the Naval Weapons Station in Seal Beach, California.

Whether you served—or are currently serving—in the Army, Navy, Marine Corps, Air Force, Coast Guard or Merchant Marine, or are perhaps one of the submariners for which this hallowed ground was initially established, here's your opportunity to preserve an honored military legacy—your own, or that of a friend or loved one—by donating a personalized Legacy Brick to the "Corridor of Courage" Walkway here at the site. For as little as \$125, your Legacy Brick can be inscribed with any name or message, and will go on display at our nationally recognized military memorial for all to see. Meanwhile, your generosity will also help us to maintain, preserve and expand this unique national treasure for the reverence of generations to come.

Go to <https://submarinememorial.org/> and click on the "Bricks" menu tab for information on sizes and specifics. Online ordering through PayPal™ makes the process easy.

Don't miss this chance to preserve a beloved legacy in perpetuity. Thank you.

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NEWS-01: USS SCORPION, SSN-589
50TH ANNIVERSARY MEMORIAL
Submitted by: John E. Markiewicz on 8/9/2017

A request has been received from the subject Memorial Committee for assistance from USSVI to make this milestone event a very memorable experience for the widows, families and former USS SCORPION crew. The event will take place from May 25 - 27, 2018 in Norfolk, Va. Chief of Naval Operations, Admiral John m. Richardson has graciously agreed to serve as keynote speaker for the memorial service.

USSVI was extremely generous with assisting in the 45th USS Scorpion SSN-589 Memorial Service by supporting the "99 for 99" fundraising efforts. They are again asking our support for this endeavor for the 50th Anniversary with the focus of the program being for each USSVI Base to donate \$99 in honor of the 99 crewmembers lost on SCORPION on May 22,1968.

All monies donated go directly to offsetting the cost of presenting the memorial service and providing a Saturday evening banquet for SCORPION families, former crew and specially invited guests.

To support the "99 for 99" program, please make donations payable to "USS SCORPION, SSN-589 ALUMNI ASSOCIATION" and mail your checks to:

MaryEtta Nolan, Treasurer
USS SCORPION, SSN-589
50TH Anniversary Memorial Committee
487 Sandhill Rd.
Greenfield Center, NY 12833-1118

All USSVI Bases are encouraged to support this event to the extent they are financially able so to do.

John Markiewicz
National Commander

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NEWS-01: 2017 ANNUAL BUSINESS MEETING AGENDA AND ANNUAL REPORTS
Submitted by: Ray Wewers on 8/15/2017

THE 2017 ANNUAL BUSINESS MEETING AGENDA FOR THE 2017 CONVENTION TO BE HELD IN ORLANDO FL IS NOW POSTED ON THE USSVI WEBSITE. ("DOCUMENTS" THEN "ORGANIZATION")

THE ANNUAL REPORTS RECEIVED FROM NATIONAL OFFICERS, REGIONAL DIRECTORS AND COMMITTEE CHAIRMEN ARE ALSO POSTED UNDER "ORGANIZATION".

I just wanted to inform you that I am the new incoming President of the International Submariners Association in the United States of America (ISA/USA) and wish to invite all of our Brothers and Sisters to the installation at the NATIONAL Convention in Orlando. The get together is set up for Sunday, September 3rd, 1300-1430 in Suwanee #17.

Thank You

Bud
John Bud Cunnally ETC (SS) Ret. USN - President Elect
International Submariners Association of the U.S.A. ISA/USA
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Selected News From the Fleet

Movie Star Submarine Retires

Julia Bergman, The Day, June 10

A celebrity of the submarine kind is being retired.

The USS Dallas (SSN-700), portrayed in the movie "The Hunt for Red October" based on Tom Clancy's Cold War thriller, has reached the end of its useful life — its military capability no longer outweighs the cost to continue to operate the submarine.

At the end of May, the Dallas arrived at Puget Sound Naval Shipyard in Bremerton, Wash. — the sole site for recycling Navy submarines — after leaving its homeport in Groton about two months earlier, transiting the Panama Canal, and making stops in Port Canaveral, Fla., and San Diego, Calif.

When commissioned on July 18, 1981, Dallas was hailed as the cutting edge of the nation's defense system. Los Angeles-class fast-attack submarines like the Dallas cost more than \$400 million to build compared to the \$2.7 billion price tag of today's Virginia-class attack submarines.

Dallas spent more than 35 years carrying out secret missions at sea, including multiple deployments to the Indian, Mediterranean and North Atlantic oceans.

The Navy squeezed every last bit out of the submarine. Its last deployment lasted nearly eight months, about the longest deployment a fast attack submarine has done since Operation Iraqi Freedom, according to Capt. Jack Houdeshell, the commanding officer for that last deployment. Dallas originally was due to be retired sooner, but the Navy in 2014 extended its service life, and retired the USS Norfolk instead to save \$10 million.

Little has been disclosed about what the Dallas did, but the submarine had a number of achievements, including two Navy Unit Commendations, which recognize heroism and outstanding actions.

"There aren't a whole lot of submarines out there now that have seen what the Dallas has seen, going through the Cold War, the Gulf War, the modern day fight with terrorism and drugs and the different missions that we do," said Senior Chief Michael Lewis, 41, Dallas' chief of the boat. "To be on a boat that's done all of that, those accomplishments are big."

Museum piece?

How does the Navy dispose of a submarine that weighs about 6,000 tons and spans 362 feet?

Weapons are removed before a submarine arrives at the shipyard. The nuclear reactor is shut down and then the fuel is removed. Spent nuclear fuel, which is still highly radioactive even at the end of a submarine's life, is shipped by rail to the Naval Reactor Facility at the Idaho National Laboratory, where it's stored in specialized containers. Spent fuel from every submarine since the USS Nautilus, the first nuclear-powered submarine, has been stored there.

Once defueled and decommissioned, submarines become "exes," for example the ex-Dallas.

Empty reactor compartments are cut out from the steel hull using torches, hand-held saws and other tools, and then taken by barge to the Hanford Nuclear Reservation near Richland, Wash., where they are buried in the ground in steel canisters. The site, where 177 tanks with more than 50 gallons of radioactive waste are stored, is only supposed to be a temporary solution. A long-term solution still is being sought. The Obama administration decided against the Yucca Mountain in Nevada, but President Donald Trump's 2018 budget request reportedly includes \$120 million to restart the licensing process for the site.

Nuclear waste has seeped from the tanks at Hanford, home to a complicated cleanup effort, and in May a tunnel used to store contaminated radioactive materials collapsed.

Once the reactor is defueled and the reactor compartment is removed, the boat's systems are inactivated, de-energized and drained, then the rest of the hull is cut up in large pieces for recycling. In some cases it's sold as scrap. Valuable materials are salvaged and reused.

At times, interested parties will approach the Navy about featuring an old submarine in a museum. The Dallas Maritime Museum is vying for the Dallas to be the centerpiece of the future museum. The Navy has indicated, however, that it's highly unlikely that an entire submarine would be donated.

Los Angeles-class submarines, which were built between the 1970s and 1990s, are being recycled at high rates — so much so, that they are reportedly piling up at the Puget Sound shipyard.

At the same time, more attack submarines are being built.

Virginia-class submarines, the replacement for the Los Angeles-class, are being built at a rate of two per year. There's talk of building three attack submarines some years. And the Navy wants to build up to 355

ships, from the 277 it has now, including 18 more submarines than previously planned, so it's unlikely the recycling will slow down.

Talk of the service

The current crew of the USS Dallas has the distinct experience of retiring the movie star submarine. They, along with shipyard workers, will take the Dallas apart piece by piece. They reflect on a boat that they've called home for months at a time.

"The harsh reality is if we had a significant casualty, the boat could be lost. As much as we take care of her, she takes care of us. This is our family. This is our life. Will she always bring us fond memories? Absolutely."

— Cmdr. David Kaiser, 46, commanding officer

"The junior guys, I don't think they understand the accomplishments and the important role that the Dallas has fulfilled for the last 30-plus years. Once they've been in for a few more years, they'll actually understand what they were a part of: the final crew, being the last in harm's way."

— Senior Chief Michael Lewis, 41, chief of the boat.

"At the reunion, we had guys (who served on Dallas) in the 1970s and 1980s. To be part of that, that's what I'm going to remember."

— David Schneck, 34, an electronics technician.

"Dallas, she definitely is iconic with the movie star heritage. You pull in someplace, whether it's the Middle East, Europe, in the States, and it's 'Hey, is that the Dallas? The one with the Russian submarine?' Yeah, that's the movie star."

— Steven Johnson, 29, an information systems technician

"You always remember when, where, what time, the date and who did it."

— Brice Stone, 21 of Stephenville, Texas, an electronics technician who earned his dolphins, meaning he qualified in submarine service, on the boat named after his home state.

[Huntington Ingalls Industries Launches Virginia-class Submarine Indiana](#) [Staff, Seapower Magazine, June 9](#)

NEWPORT NEWS, Va. — Huntington Ingalls Industries announced June 9 that the Virginia-class attack submarine Indiana (SSN 789) was recently launched into the James River at the company's Newport News Shipbuilding division. The boat was moved to the shipyard's submarine pier for final outfitting, testing and crew certification.

"Launch is a true testament to our shipbuilders' roughly four years of hard work," said Matt Needy, vice president of submarines and fleet support, Newport News. "Over the next several months, we will work closely with the Indiana crew to bring this great ship to life. With the Navy's recent increase in SSN force structure requirements from 48 to 66 submarines, the shipbuilders here at Newport News and at our teaming partner, Electric Boat, understand the importance of getting these highly valued ships delivered and ready for mission-tasking by our Navy leadership."

Indiana is the 16th Virginia-class submarine and the eighth that will be delivered to the U.S. Navy by Newport News. Nearly 4,000 shipbuilders have participated in Indiana's construction since the work began in September 2012.

Indiana was moved out of a construction facility into a floating dry dock using a transfer car system. The floating dry dock was submerged, and the submarine was launched into the James River. The approximately 7,800-ton submarine was moved to the shipyard's submarine pier, where final outfitting, testing and crew certification will take place.

"Our Indiana Sailors are honored to be at the helm as the newest Hoosier boat launches into a new

chapter at sea," said Cmdr. Jesse Zimbauer, Indiana's commanding officer.

Virginia-class submarines, a class of nuclear-powered fast-attack submarines, are built for a broad spectrum of open-ocean and littoral missions to replace the Navy's Los Angeles-class submarines as they are retired. Virginia-class submarines incorporate dozens of new technologies and innovations that increase firepower, maneuverability and stealth and significantly enhance their warfighting capabilities. These submarines can support multiple mission areas and can operate at submerged speeds of more than 25 knots for months at a time.

[Can Anything Save Rusting Submarine From the Scrap Heap?](#)

[Sara Jrde, NJ, June 15](#)

HACKENSACK - The city's 2,500 ton resident, lurking in the murky Hackensack River, doesn't seem to be moving anytime soon, despite plans for a large development project nearby.

The USS Ling is a 312-foot long submarine from World War II that has been berthed in Hackensack since the 1970s, in the water adjacent to the longtime home of The Record newspaper.

The Borg family, which owns 20 acres of property that abut the boat and owned the paper before selling it to Gannett last year, previously leased its land to a museum that offered tours of the vessel.

The family, under its development company, Fourth Edition, is planning on redeveloping the land, but has not requested the vessel be taken away.

"Fourth Edition and its owners have not asked to have the submarine removed," said Bob Sommer, a spokesman for the development company.

Fourth Edition plans to secure a partner for a project that would include 200 apartments in the first phase and then 300 additional apartments, a hotel and retail space.

"It's not on their property. If it stays, it stays. If it goes, it goes," Sommer said.

The group of veterans who run the museum say they cannot afford to move the boat -- and have struggled to make basic repairs.

For example, an online fundraising effort had trouble raising \$25, said Les Altschuler, vice president of the Submarine Memorial Association, which runs the New Jersey Naval Museum.

Located off River Street, behind the New Heritage Diner, Ling's long time in the water is evident -- there are holes in the structure and it's peppered with rust. The hull though, Altschuler is quick to point out, is still intact.

The boat used to be open for tours, birthday parties, business events and overnight stays. The museum, in a trailer nearby the submarine, held artifacts.

The USS Ling, a Balao class submarine, was launched during WWII. It was used as a training vessel and never saw battle. Once in Hackensack, the Ling held commemorative ceremonies and other events on the grounds.

But the boat was damaged during Hurricane Sandy and subsequently closed.

The lease for the land between the Borgs and the museum had been month-to-month since 1994, and the museum was notified last year that the arrangement was ending.

"Fourth Edition has offered them to move [the museum trailer], they just need to know where to move it to," Sommer said.

After the Borgs notified the museum that the lease arrangement was ending, the Navy came in and took back the more prominent artifacts it had loaned to the museum.

Altschuler admitted that his group has difficulty raising money. And if there was money, transporting the boat away from the site would be a monumental task.

When the Ling was first brought to Hackensack, Altschuler said there was about 31 feet of water. He now estimates that there's a fraction of that and the boat is buried in mud and silt.

And if the group could move it from the site, there are bridges that won't open for USS Ling to pass, he said.

Altschuler says he "doesn't have the answer," but that his group hasn't "given up."

"We have no plans to scrap the boat, we're trying to preserve the boat," Altschuler said.

The city isn't responsible for the USS Ling either, said Albert Dib, city historian and director of redevelopment.

"We hold out hope someone will hatch a plan and maintain it for future visitors and the city would welcome a plan that was sustainable," Dib said.

A spokeswoman for the Naval Sea Systems Command, which oversees Navy vessels, confirmed the submarine was the New Jersey Naval Museum/Submarine Memorial Association's property.

If a nearby city wanted to take the submarine, it would contact the current owners, who would ask the Navy to make a transfer.

The current owner would pay for the transfer, Spokeswoman Colleen E. O'Rourke said.

"It was, if nothing else, an important landmark for us," Dib said.

[The Navy Just Laid The Keel for its Latest Attack Submarine](#) [Jennifer Mcdermott, Associated Press, July 9](#)

PROVIDENCE, R.I. — The keel of the nation's 20th Virginia-class attack submarine named for Oregon is being laid at the manufacturing plant for General Dynamics' Electric Boat.

The milestone is being marked Saturday at a Rhode Island shipyard. It comes at a time when many in Congress and in the military are eager to get more submarines into the fleet.

Groton, Connecticut-based Electric Boat and Newport News Shipbuilding in Virginia have an agreement to build two attack submarines annually.

The House and Senate Armed Services Committees have each approved bills to authorize building three submarines instead of two in some years, and also authorize additional funding to prepare for the increased work.

The future USS Oregon is expected to cost about \$2.7 billion and be delivered to the Navy in November 2019.

"Oregon is going to be put to work the minute it's launched because the demand signal is at the highest level," said U.S. Rep. Joe Courtney, a Connecticut Democrat.

The keel-laying comes at a time when many in Congress and in the military are eager to get more submarines into the fleet. Groton, Connecticut-based Electric Boat and Newport News Shipbuilding in Virginia have an agreement to build two attack submarines annually.

The House and Senate Armed Services Committees have each approved bills to authorize building three submarines instead of two in some years, and also authorize additional funding to prepare for the increased work.

"It's really a robust, bipartisan recognition that submarines are the stealthiest, strongest and most survivable among most of our naval assets," said U.S. Sen. Richard Blumenthal, a Connecticut Democrat.

The Oregon is one of a group of submarines with design changes so the submarines will need one less period in the shipyard for maintenance over their lifespan, according to the Navy. Consequently, they will be able to do one more deployment over their lifespan, for a total of 15 deployments.

For centuries, U.S. Navy ships have had female sponsors who christen the vessels. It is said that the sponsor's spirit and presence guides the ship throughout its life. Public officials and wives of senior naval officers serve as sponsors for many of the ships named after places.

The Oregon's sponsor is Dana Richardson, wife of Adm. John Richardson, the chief of naval operations and a submariner. Richardson, a native of Corvallis, Oregon, said she wants to use what she's learned over 35 years as a military spouse to help sailors and their families. She said their unique way of life is rewarding, but also challenging.

"We already have a pretty big family, five kids, but I feel like now I'm gaining a bigger family," she said. "My family is expanding to include dedicated, committed sailors and their families, and I'm looking forward to being a part of their lives."

[Michigan \(B\) Conducts Change of Command Ceremony](#) [MC1 Amanda Gray, Navy.mil, July 10](#)

BANGOR, Wash. - The Blue crew of the guided-missile submarine USS Michigan (SSGN 727) conducted a change of ceremony at Naval Base Kitsap-Bangor, July 7.

Capt. Bradley Terry, from Calvert City, Kentucky, relieved Capt. Joseph Turk, from Eau

Claire, Wisconsin, and assumed the duties and responsibilities of the Michigan Blue crew commanding officer during the ceremony at Deterrent Park.

Turk assumed command of Michigan Blue July 7, 2015, during a change of command ceremony in Yokosuka, Japan. This was the first time the boat performed a change of command ceremony in Japan.

"Being in command of Michigan was an honor," said Turk. "The ship is a technical marvel; able to operate independently, unsupported, undetected, for months if necessary, carrying with it a lethal combination of torpedoes, cruise missiles, and naval special warfare equipment, unmatched by any other platform. As awesome as it is, Michigan is a 35-year-old ship. And a 35-year-old ship doesn't run itself. It is the people that make Michigan and her sister submarines the best submarine force on the planet."

Under Turk's leadership, the boat conducted the first guided-missile submarine maintenance and modernization period with two crews working together. During this time, he oversaw necessary modifications to support the integration of the first enlisted women on submarines ever in U.S. history. The Michigan Blue crew also completed the first Western Pacific deployment with a fully integrated crew onboard a submarine.

The crew completed multiple certifications to get the boat ready for deployment and during their most recent deployment, the boat made national headlines when they pulled into Busan, Republic of Korea, for a port call. His efforts resulted in the boat receiving the Commander, Submarine Force, U.S. Pacific Fleet, 2016 Retention Excellence Award.

"To the crew of Michigan Blue, you are the fabric of America," said Turk. "You are what make Michigan great. You did what I think is the hardest job in the submarine force. I pushed hard and demanded excellence from each of you, and despite a few stumbles here and there, we achieved success."

Turk's next assignment will be at Commander, Submarine Squadron 19, in Bangor, Washington, where he will serve as deputy commodore.

Terry comes to Michigan Blue from Commander, Submarine Force, U.S. Pacific Fleet, where he served as the senior member of the Tactical Readiness Evaluation team located in Hawaii.

"The SSGN cycle is the most demanding in the submarine force, but there is no other spot I would rather be standing today than right here, taking command of a seagoing crew of SSGN submarine Sailors," said Terry. "I am humbled and honored to be given the second opportunity by the submarine force leadership to have the most coveted and rewarding job in the United States Navy - command at sea."

Armed with tactical missiles and equipped with superior communications capabilities, Michigan has the ability to conduct large-volume short-notice strike missions and covertly deploy Special Operations Forces.

Michigan and its sister ship, USS Ohio (SSGN 726), are both homeported at Naval Base Kitsap-Bangor.

[USS California Holds Change of Command Ceremony](#)

[MCC Steve Owsley, Navy.mil, July 11](#)

GROTON, Conn. – The nuclear-powered, Virginia class, fast-attack submarine USS California (SSN 781) held a change of command ceremony in the Dealey Theater at Naval Submarine Base Groton, July 7.

Cmdr. Eric Sager transferred command of California to Cmdr. David Payne in a ceremony attended by Chief of Naval Operations Adm. John Richardson and Commander, Submarine Forces Vice Adm. Joseph Tofalo.

Richardson, who was Sager's commanding officer aboard USS Honolulu (SSN 718), took the opportunity to praise the entire Sager family and talk about the experiences of serving together. When speaking of the ongoing relationship with the Sager family Richardson said, "That's what the Navy is all about, a magical intersection of knowledge, excellence, love and family."

Sager opened his speech by saying, "I am humbled at the turnout to celebrate California's success and honored to be a part of this great crew, great Navy and great nation."

Sager reflected on what it meant to be a submarine's commanding officer.

"Commanding a submarine is the most spectacular and rewarding endeavor. It is all-encompassing, demanding of every second of your time and never ceasing to bring a challenge when least expected. It has been an awesome responsibility that I am honored to have had over the last two and a half years, but it cannot be done alone. All of you here today and hundreds who couldn't make it supported me and Moira and the crew of California."

Sager, a well-known and self-professed sports fan, included quotes from Team USA Hockey Coach Herb Brooks, former New York Yankee Derek Jeter, and Duke Basketball Coach Mike Krzyzewski, to recognize the crew of California's exceptional accomplishments, hard work and operational capability.

California's new commanding officer spoke to the California family when he said, "To the crew and families of the California, I have enjoyed getting to know you over the past couple of weeks. I look forward to continuing to develop those relationships and meeting the challenges we face ahead with a humble attitude and a hunger for success. You truly bring this ship to life, and I am honored to be your captain."

[Pardon Request Denied For Former Groton Sailor In Submarine Photos Case](#)

[Julia Bergman, The Day, July 11](#)

The Justice Department has denied a pardon request from a former Navy sailor currently in prison for illegally taking pictures on a nuclear attack submarine.

Kristian Saucier, 30, is about nine months into his 12-month sentence at the Federal Medical Center at Fort Devens in western Massachusetts for being convicted of one count of unauthorized retention of national defense information, a felony.

Jeffrey Addicott, director of the Center for Terrorism Law at St. Mary's Law School in Texas, who said he is offering his services pro bono, submitted petitions for a presidential pardon and clemency on behalf of Saucier in January. Addicott also had to submit an application to waive the required five-year waiting period before anyone convicted of a federal offense is eligible to apply for a presidential pardon. That period starts from the time someone is released from confinement.

The waiver was denied, but the clemency request still is pending. The response from the Office of the Pardon Attorney says that the office has concluded it would "not be appropriate" to grant a waiver in Saucier's case.

"We do not believe that Mr. Saucier's circumstances in this regard are so unusual as to justify a waiver of the waiting period. Waivers are infrequently granted and then only for particularly compelling reasons," the response says, in part. "It may ultimately be to Mr. Saucier's benefit to wait the full five years to demonstrate that he has become fully rehabilitated and is a contributing member to society."

Addicott said the response from the office, which is dated May 30, 2017, and unsigned, wasn't sent to him and was sent instead to a lawyer who previously worked on Saucier's case. He initially thought the letter must be fraudulent but later was able to authenticate it once he received a copy.

"This is extremely unprofessional and indicates not only a shocking level of incompetence at the Office of the Pardon Attorney but signals clearly that our hard work received a only pro forma look and never got out of that office to the Department of Justice or to President Trump," he said.

Addicott also pointed to remarks made by Trump during a televised interview in late January with Sean Hannity of Fox News, indicating that he was "looking at the case." Addicott said he asked Hannity to bring up Saucier's case during the interview.

Saucier was a machinist's mate aboard the USS Alexandria when on at least three different occasions in 2009 he used his cellphone camera to take pictures of various technical components of the submarine's nuclear propulsion system while it was docked at the Naval Submarine Base in Groton.

During Saucier's sentencing, Assistant U.S. Attorney Vanessa Richards, a prosecutor for the case, said the

photographs documented the submarine's entire propulsion system. "The technology that's documented in these photographs is, quite literally, an engineering and a scientific wonder," she said.

The government sought a sentence of 63 months in prison.

Passing Dolphins

[SUBLANT Public Affairs, Navy.mil, July 11](#)

The Dolphins

I wait patiently in a dimly lit ball room as crowds gathered around tables are called to stand. The few lights that offer illumination seem to gather on me as a camera flash suspends the proceeding moments in time.

My chin is held high with pride. My eyes are affixed without blinking and the greeting waves around me stop in motion. Those in attendance cheer as I receive my recognition, honoring a Navy tradition practiced by countless submariners before. The glint of gold light spills off of me as I take my place center stage.

I embody a level of professionalism and knowledge to which only those in the submarine force know the extent of. I know the full might of the submarine as a weapon, from its bow to its stern, and the damage control actions necessary to save her when called to. My crew mates instantly recognize me at a glance, as well as the captain, knowing that they can trust me with the safe operation of the boat.

I didn't know the name of the man joining me on the stage until it was called out, but for him to be here, I know he has been tested, tried and found worthy. I am present in recognition of this achievement.

He is qualified.

I am the dolphins of the United States submarine force and have been pinned countless times since my inception was cast into silver and gold 93 years ago.

The Submariner

The significance of this ceremony was not lost on Lt. j.g. Jeremy Brown, as he stood at attention while the commander of the submarine forces pressed the golden pins into the breast of his uniform. The son of a submariner, Brown knew he would need to call his father first to tell him the news.

"It was a great honor," said Brown. "As soon as I could, I told my dad about it and he wanted the pictures. He got the opportunity to embarrass me a little bit. They recently held the USS Ray reunion, which is one of his submarines, and they came aboard and toured John Warner. So I talked to his old submarine buddies and they brought it up and talked about it. So it's just been humbling."

Brown enlisted in the Navy in 2004 and earned his enlisted submarine warfare "Dolphins" pin prior to being selected for the STA-21 program and attending the University of South Carolina. He now serves as the assistant operations officer aboard USS John Warner (SSN 785) and has earned a special set of the gold dolphins.

"The silver enlisted dolphins and the gold submarine dolphins are a little bit different," said Brown. "Enlisted dolphins mean that you can save your shipmates and the officer dolphins mean that you can fight the ship in times of war. They both have a lot of significance to me. I wouldn't compare one to the other, but I am very proud of both."

"For those future qualified officers who find themselves standing in front of the submarine community during the birthday ball, please enjoy it, appreciate what it means, and share the memory," imparted Brown.

"It was a great honor, but also very humbling," said Brown. "It gives a personal connection to USS Thresher. Every submariner knows how significant the loss of the Thresher was and how it changed how we operate and think about submarine safety, so just being able to wear the captain's dolphins make it personal and that much more important to me."

The Legacy

When USS Thresher (SSN 593) sank below the surface for the final time in April 1963, the commanding officer, Lt. Cmdr. John "Wes" Harvey was wearing one of his two sets of dolphins. The other was left behind with his wife, Irene.

Six years later, Irene Harvey decided to pass those dolphins on to her niece's husband, Ted Hack, when he graduated from submarine school. Ted Hack, who retired as a captain in 1997, would pass the dolphins on at the Thresher 50th anniversary ceremony held in remembrance of the boat's sinking. They were then passed to

Lt. Chris Miller, the most recently qualified submariner at the 2013 Submarine Birthday Ball in Washington, D.C., with the condition they be passed on to the newest qualified submarine officer every year after. This year they were passed to Lt. j.g. Jeremy Brown.

The Thresher Dolphins, as they have become known, rest with the newest submarine officer, carrying on the mission of protecting our undersea domain, the mission that Lt. Cmdr. Harvey began 54 years ago.

[Russia Completes Design Work for New 5th Generation Submarine](#)

[Franz-Stefan Gady, The Diplomat, July 12](#)

Russia is moving forward with plans to develop a new fifth-generation submarine with preliminary design work on the boat completed, according to Russia's state-owned United Shipbuilding Corporation.

"The preliminary design for the advanced fifth-generation non-nuclear submarine was developed by the Rubin Central Design Bureau has already been completed, and the approval of the draft proposal for the ship's engineering design is being discussed, Vice President for Naval Construction, Igor Ponomaryov, told TASS news agency on July 11. "The decision on its construction will be taken after the engineering design is completed."

Not much is known about Russia's latest submarine project, purportedly code named Project Kalina, except that the new sub will be equipped with an air-independent propulsion (AIP) system, a technology that the Russian defense industry has been struggling with for years. The new boat will also feature new noise reduction technology, automated control systems, reactor safety, and a host of long-range weapons systems.

The Director General of the Rubin Central Design Bureau, Igor Vilnit, has told reporters previously that the new fifth-generation boat will be based on the Project 677 Lada-class diesel-electric attack submarine. Initially, the Lada-class was to be fitted with AIP technology. However, the Rubin Design Bureau has so far not successfully tested an AIP system aboard a submarine.

As I reported in February 2016, According to the head of the Russian Navy's shipbuilding department, Captain (1st Rank) Vladimir Tryapichnikov, a new AIP system will not be ready until the early 2020s. "We presume that an AIP will be developed in the near future, and the Rubin Design Bureau has started such work recently," he said in 2016. "They have laid a good foundation ... Rubin's designers keep on working hard [to develop the AIP], and we believe it will be developed in 2021-2022."

Russia's Lada-class of submarines has also faced multiple delays over the years:

The Russian Navy initially planned to field three Lada-class submarines by 2018. However, delays in the program have so far only lead to the service entry of the lead vessel of the class, the St. Petersburg in 2010, which has been undergoing operational evaluation ever since.

The St. Petersburg was already laid down in 1997 at the Admiralty Shipyard in St. Petersburg. Construction of its sister ships, the Kronstadt and Velikiy Luki began in 2005 and 2006 respectively, yet production of the two Lada-class subs was put on halt for some time and then restarted in 2013.

The likely commissioning date of the two remaining subs of the class is 2019. Similar to the Lada-class, the principal mission of the new fifth-generation Kalina-class submarine likely will be coastal defense against enemy submarines and surface vessels, surveillance and reconnaissance as well as intelligence gathering missions.

[Scourge of Sneaky Russian Spy Submarines As Soaring Number Of Vessels Spotted 'Lurking' Off Faslane](#)

[Stephen Stewart, Daily Record, July 12](#)

Soaring numbers of Russian naval ships have been caught in British waters – including submarines “lurking” near Faslane .

And a foreign affairs think tank fear the Russians are trying to track Britain's nuclear-armed Vanguard subs to obtain their “signature”.

The Henry Jackson Society said the “alarmingly regular” contacts show “a worrying picture of the revival of Cold War Russian habits of probing our defences by sea and, especially, by air”.

In one incident in August 2010, a Russian Akula-class Typhoon sub stood off Faslane “waiting for a

Trident-capable Vanguard-class submarine to leave the port”.

Dr Andrew Foxall, director of the society’s Russian Studies Centre, pieced together official air intercept statistics and media reports of naval contacts, which are not recorded by the Ministry of Defence, and found a rise in Russian intrusions in UK territory.

The report said: “Russia’s submarines, which lurk off naval bases in Scotland, seek even ... sensitive information: the ‘acoustic signature’ made by the UK submarine fleet, including the Vanguard submarines that carry Trident nuclear missiles.

“If Russia were able to obtain a recording of the ‘signature’, it would have serious implications for the UK’s nuclear deterrent: Russia would be able to track Vanguards and potentially sink them before they could launch their missiles.”

There were 12 reported Russian naval approaches in UK seas between 2013 and 2016.

There had been just two in the previous seven years. More than half of the 43 reported contacts by air and sea between 2005 and 2016 occurred in the most recent three years. Dr Foxall added:

“There is a troubling picture of close encounters and emergency scrambles perpetuated by an aggressive Russian government ... these Russian activities are best understood not in isolation, but rather as a part of the Kremlin’s increasingly assertive foreign policy toward the West.”

An MoD spokesman said: “We keep all threats under constant review and have robust security measures in place to combat them.

“This includes RAF Quick Reaction Alert Typhoon aircraft, a Royal Navy warship held at continuous high readiness and the ultimate guarantee of our security, the nuclear deterrent.”

The Russian Embassy said: “Perhaps the UK military would be best placed to comment. We do not hold the Henry Jackson Society in very high regard.”

[U.S. Navy Fires First Tomahawk Cruise Missiles From New Submarine Payload Tubes](#) [Raytheon, PR Newswire, July 18](#)

Upgrades to Virginia-class, fast attack subs will greatly enhance their firepower
TUCSON, Ariz. – For the first time, the U.S. Navy test fired two Raytheon (NYSE: RTN)-built Tomahawk cruise missiles from new submarine payload tubes on the Virginia-class USS North Dakota (SSN-784). The tests, in the Gulf of Mexico near Florida, proved the submarine's ability to load, carry and vertically launch Tomahawk missiles from the new Block III Virginia Payload Tube. The upgraded tubes feature fewer parts and will be even more reliable.

In addition to the new payload tubes, the Navy is also developing a new Virginia Payload Module. The new modules will triple the number of Tomahawk missiles that Virginia-class submarines can carry, dramatically increasing each sub's firepower.

"As the Navy continues to modernize its subs, Raytheon continues to modernize Tomahawk, keeping this one-of-a-kind weapon well ahead of the threat," said Mike Jarrett, Raytheon Air Warfare Systems vice president. "Today's Tomahawk is a far cry from its predecessors and tomorrow's missile will feature even more capability, giving our sailors the edge they need for decades to come."

The U.S. Navy continues to upgrade the Tomahawk Block IV's communications and navigation capabilities, while adding a multi-mode seeker so it can hit high-value moving targets at sea. These modernized Tomahawks are on track to deploy beginning in 2019 and will be in the U.S. Navy inventory beyond 2040.

Fired in combat more than 2,300 times, Tomahawk cruise missiles are used by U.S. and British forces to defeat integrated air defense systems and conduct long-range precision strike missions against high-value targets. Surface ships and other classes of submarines can carry more than 100 Tomahawks when needed.

[Pentagon Nominates 5th, 3rd Fleet Commanders, Announces OPNAV Staff Appointments](#) [Megan Eckstein, USNI News, July 17](#)

The Navy announced several major staffing changes, including nominating two new numbered fleet

commanders and two new appointments on the chief of naval operations' staff.

Vice Adm. John Aquilino, who currently serves as deputy chief of naval operations for operations, plans, and strategy (OPNAV N3/N5), is nominated to serve as the next commander of U.S. 5th Fleet and commander of U.S. Naval Forces Central Command.

Aquilino graduated from the U.S. Naval Academy in 1984. He earned his wings in 1986, has flown the F-14 A/B Tomcat and the F-18 C/E/F Hornet, and graduated from Navy Fighter Weapons School (TOPGUN). Aquilino has commanded Strike Fighter Squadron VF-11, Carrier Air Wing (CVW) 2, and Carrier Strike Group (CSG) 2. As a flag officer, he served as director of Strategy and Policy (J5) at U.S. Joint Forces Command, deputy director for Joint Force Coordinator (J31) at the Joint Staff, and director of Maritime Operations at U.S. Pacific Fleet.

Rear Adm. John Alexander, the current director of maritime operations at U.S. Fleet Forces Command, was nominated to the rank of vice admiral and to serve as the next commander of U.S. 3rd Fleet in San Diego.

Alexander was designated a naval flight officer in November 1983 and served as an A-6E bombardier/navigator. He has commanded Electronic Attack Squadron (VAQ) 135, amphibious transport dock USS Juneau (LPD-10) and aircraft carrier USS Abraham Lincoln (CVN-72). As a flag officer he commanded Battle Force 7th Fleet (CTF 70/CSG 5), forward deployed aboard USS Ronald Reagan (CVN-76) in Yokosuka, Japan.

Rear Adm. Rear Adm. Bill Merz, the current director of undersea warfare on the chief of naval operations' staff (OPNAV N97), was nominated to the rank of vice admiral and to serve as the next deputy chief of naval operations for warfare systems (OPNAV N9).

Merz is a 1986 graduate of the U.S. Naval Academy and has previously commanded USS Memphis (SSN-691) and Submarine Development Squadron (DEVRON) 12. Just prior to coming to the Pentagon to lead OPNAV N97, Merz commanded Submarine Group 7, which encompassed both Task Force 74 in Yokosuka, Japan, and Task Force 54 in Bahrain.

Rear Adm. John Tammen will replace Merz as director of undersea warfare. He currently serves as commander of Submarine Group 9 in Washington. Tammen has commanded USS Georgia (SSBN/SSGN-729) and Submarine Squadron (SUBRON) 19. He has also worked for N97 previously, as a section head for platforms, payloads and budget and as deputy director. Prior to commanding Submarine Group 9, Tammen served as deputy director for plans and policy (J5) at U.S. Strategic Command.

[Trident Refit Facility's Clean Sweep Receives SECNAV's FY16 Safety Award after Two Straight CNO Safety Achievements](#)

[Tim Austin, Navy.mil, July 17](#)

KINGS BAY, Ga. - Capt. Gunter Braun, Trident Refit Facility (TRF) Kings Bay commanding officer, and representatives from the TRF safety department were presented a citation and a plaque by Under Secretary of the Navy Thomas P. Dee during a ceremony at the Navy Memorial in Washington, June 29.

The Safety Excellence Award recognizes Navy and Marine Corps commands that demonstrate extraordinary excellence by sustained mission success with simultaneous exemplary safety performance.

The award was established in 2002 by Gordan R. England, who served twice as the secretary of the navy.

In fiscal year 2016, TRF's workforce of 1,473 civilians and 187 Sailors completed three dry-dockings, 10 pier-side refits, two overseas availabilities, 21 short-notice repair periods, and one foreign submarine maintenance period.

TRF personnel also supported more than 453 tons of ordnance handling evolutions, which encompassed nearly 1 million man-hours of production work where total mishaps were reduced by 15 percent, and mishaps that resulted in one or more lost days of work were reduced by 45 percent.

In addition, a deliberate focus on noise hazards resulted in a 56 percent decrease in Occupational Safety and Health Administration reportable hearing loss cases.

Over a three year period, TRF personnel reduced the number of moderate risks by 85 percent, reduced minor risks by 81 percent, and negligible risks by 46 percent.

Braun congratulated TRF employees after raising the SECNAV Safety Flag.

"Being recognized for this coveted award is a testament to our commitment to safety excellence," he said. "We started this journey years ago and by integrating safety into our day-to-day operations, TRF has accelerated this important culture change. I am very proud of all our employees who make safety excellence

part of our business. Remember... 10 fingers, 10 toes."

TRF was awarded the Fiscal Year 2015 and 2016 Chief of Naval Operations Shore Safety Award in the medium industrial-level category.

Back-to-back awards, followed by selection as the 2016 SECNAV Safety Excellence Award winner, showcased a "clean sweep" for TRF's commitment to outstanding support and achievement in Navy safety and occupational health and promoting a culture of safety throughout the command.

Alan Heckman, TRF's safety and environmental director, said the award further recognizes the dedication to safety that has been instituted at all levels throughout TRF.

"It reinforces that a culture has been developed where safety occurs at all levels and is an 'all in approach,'" he said. "I am proud to say that not only do we maintain submarines better than anyone else, but that we also do it safely."

TRF will proudly fly the SECNAV Safety Flag for one year, until presented to the fiscal year 2017 awardee.

[US Intelligence Shows North Korean Preparations For A Possible Missile Test](#)

[Barbara Starr and Ryan Browne, CNN, July 20](#)

CNN has learned that US intelligence indicates that North Korea is making preparations for another intercontinental ballistic missile (ICBM) or intermediate range missile test.

Two administration officials familiar with the latest intelligence confirm there are indicators of test preparations that could lead to a potential launch in about two weeks.

US satellites have detected new imagery and satellite-based radar emissions indicating North Korea may be testing components and missile control facilities for another ICBM or intermediate launch, officials say.

The US is watching in particular for further testing of North Korean radars and communications that could be used in a launch. The next test launch would be the first since North Korea successfully launched an ICBM on July 4.

Officials also say that North Korea is continuing to test components to launch a missile from a submarine but the US intelligence assessment is that program remains in early stages.

At the same time, a North Korean submarine was spotted in international waters engaging in "unusual activity," two defense officials said.

North Korea's submarine fleet is believed to encompass around 70 subs, though the majority are quite old and likely cannot fire missiles.

When taken together, these developments are concerning because North Korea says it is trying to develop a missile capable of delivering a nuclear warhead to the United States.

Pyongyang has long maintained the ability to legitimately threaten the United States with a nuclear attack is the only way to protect itself against any US-led attempts at regime change.

Land-based and submarine-based missiles are considered two-thirds of what is known as the "Strategic Triad," a theory that a state must have land, air and sea based nuclear attack capabilities to successfully deter an enemy from trying to attack it.

The latest intelligence about a potential second ICBM test comes as the second highest ranking US military officer has warned Congress that North Korea's deception techniques to mask their missile launches have grown in sophistication.

"I am reasonably confident in the ability of our intelligence community to monitor the testing but not the deployment of these missile systems. Kim Jong Un and his forces are very good at camouflage concealment and deception" General Paul Selva, vice chairman of the Joint Chiefs of Staff, told the Senate armed services committee on Tuesday.

Selva gave the strongest public indication so far that the US believes the current North Korean ICBM still has limitations, saying that Pyongyang has yet to demonstrate the "capacity to strike the United States with any degree of accuracy or reasonable confidence of success."

Selva said North Korean guidance and control systems for a long range missile still would have to be improved before a missile could actually strike the US.

When asked about the possibility of a preemptive US military strike, Selva said, "I think we have to entertain that potential option. That would be a policy choice by the President of the United States to execute

or not execute that option."

But Defense Secretary James Mattis has long warned against letting the North Korean situation get to the point of a US military strike and has strongly and publicly advocated for a diplomatic solution led by the State Department.

Selva, who is deeply involved in the US nuclear weapons and missile defense programs, noted a parallel line of effort is underway to "provide for the defense of the United States with a suitable ballistic missile defense system that can handle the low volume at this point of missiles that he (Kim Jong Un) might be able to deploy that could strike us here across all of US territory, Alaska, Hawaii and the lower 48."

The preparations for a potential new launch come as the US military has observed North Korea carrying out an "unusual level" of submarine activity as well as testing a critical component of a missile that could potentially be launched from a submarine.

Two US defense officials told CNN that that a North Korean Romeo-class submarine is currently engaged in "unusual deployment activity" in the Sea of Japan/East Sea and has been under way for about 48 hours. The US is observing the sub via reconnaissance imagery and the officials said the submarine's patrol had taken it farther than it has ever gone, sailing some 100 kilometers out to sea in international waters. The submarine's activity was different than the typical training activity usually observed closer to shore, according to the officials.

The diesel-electric-powered North Korean sub spotted far from port is about 65 meters long and the US does not assess it capable of venturing very far from its home port.

The activity caused US and South Korean forces to slightly raise their alert level, according to one official.

The US military pays close attention to North Korean submarine activity following the 2010 Cheonan incident where a North Korean sub torpedoed a South Korean Naval vessel.

The deployment comes days after Pyongyang tested a critical component for a missile that could potentially be launched by a submarine. The test took place on land at the Sinpo shipyard in North Korea. The current US intelligence assessment is that the missile program aboard submarines remains in the very early stages.

An ejection test in May tested the missile's "cold-launch system," which uses high pressure steam to propel the missile out of the launch canister into the air before the missile's engines ignite, preventing damage to the submarine or submersible barge that would launch the missile. It is the type of technology that allows missiles to be launched underwater from submarines.

Last summer, North Korea conducted what experts believed was its first successful submarine missile test, firing a missile called the KN-11 or Pukguksong-1.

That missile believed to have been modified for use on land. Both the Pukguksong-1 and Pukguksong-2 -- the land-based variant -- were on display during a military parade in April.

[North Korea's Next Missile Test Could be Launched From a Submarine](#)

[Conor Gaffey, Newsweek, July 20](#)

North Korea may be preparing for another missile launch aimed at the United States.

Kim Jong Un's regime conducted its first successful intercontinental ballistic missile (ICBM) test on July 4—Independence Day in the U.S.—with some experts speculating that the missile could reach the U.S. states of Alaska and Hawaii, or even the Pacific Northwest.

And now the totalitarian regime appears to be preparing for submarine-based missile launches in the future.

Two U.S. defense officials told CNN on Thursday that a North Korean submarine was engaged in "unusual deployment activity" over the past 48 hours. The 65-meter-long submarine has sailed 62 miles out into international waters in the Sea of Japan/ East Sea, farther than the vessel has ever gone before.

U.S. officials are following the submarine via reconnaissance and the abnormal activity caused American and South Korean forces to slightly raise their alert level, according to one of the officials.

North Korea has long claimed that its nuclear weapons program is a necessary defense against the prospect of regime change enforced by Washington. The east Asian state ramped up its anti-American propaganda following the first ICBM test, calling out U.S. Defense Secretary James Mattis and releasing two postage stamps, one with North Korean warheads pointed at the U.S. Capitol and another showing a fist destroying a

U.S. missile.

The recent ICBM test has hammered home the prospect of a North Korean attack on the U.S. or on regional enemies such as South Korea or Japan. It provoked a range of reactions: U.S. President Donald Trump vowed to confront the threat from Pyongyang “very strongly,” but South Korea’s president has proposed military talks with the North in a bid to de-escalate tensions.

North Korea is thought to have around 70 submarines, however many of them may not be able to fire missiles. In May, the state conducted a successful missile test using a “cold-launch” system, an integral component for launching missiles from submarines without damaging the vessels.

The country is already thought to have the capacity to launch a missile from a submarine, though it is unclear how far such a weapon would be able to travel. In August, experts claimed North Korea had conducted its first successful rocket launch from an underwater submarine; the missile was launched from a Gorae-class submarine, traveled 311 miles and was the first to reach Japan’s air defense identification zone, CNN reported.

U.S. intelligence agencies currently believe Pyongyang’s submarine missile program is in its early stages. But given the July 4 test and Pyongyang’s recent rhetoric, the latest developments will be a source of concern in Washington.

[U.S. Navy Fires First Tomahawk Cruise Missiles From New Submarine Payload Tubes](#) [Staff, Aerotech News, July 19](#)

TUCSON, Ariz.—For the first time, the U.S. Navy test fired two Raytheon-built Tomahawk cruise missiles from new submarine payload tubes on the Virginia-class USS North Dakota (SSN-784).

The tests, in the Gulf of Mexico near Florida, proved the submarine’s ability to load, carry and vertically launch Tomahawk missiles from the new Block III Virginia Payload Tube.

The upgraded tubes feature fewer parts and will be even more reliable.

In addition to the new payload tubes, the Navy is also developing a new Virginia Payload Module. The new modules will triple the number of Tomahawk missiles that Virginia-class submarines can carry, dramatically increasing each sub’s firepower.

“As the Navy continues to modernize its subs, Raytheon continues to modernize Tomahawk, keeping this one-of-a-kind weapon well ahead of the threat,” said Mike Jarrett, Raytheon Air Warfare Systems vice president. “Today’s Tomahawk is a far cry from its predecessors and tomorrow’s missile will feature even more capability, giving our sailors the edge they need for decades to come.”

The U.S. Navy continues to upgrade the Tomahawk Block IV’s communications and navigation capabilities, while adding a multi-mode seeker so it can hit high-value moving targets at sea. These modernized Tomahawks are on track to deploy beginning in 2019 and will be in the U.S. Navy inventory beyond 2040.

Fired in combat more than 2,300 times, Tomahawk cruise missiles are used by U.S. and British forces to defeat integrated air defense systems and conduct long-range precision strike missions against high-value targets. Surface ships and other classes of submarines can carry more than 100 Tomahawks when needed.

[Underwater Bloodhounds: DARPA’s Robot Subs](#) [Sydney J. Freedberg Jr., July 19](#)

Run silent, run deep — and now, run in packs? Submarines are traditionally lone wolves, but the rise of robotics is starting to change that. Just yesterday, defense contractor BAE announced a \$4.6 million award from DARPA to build an Unmanned Underwater Vehicle (UUV) to accompany manned submarines, helping them spot targets by sending out active sonar pulses.

While the contract is tiny by Pentagon standards, it’s a harbinger of things to come underwater. Done right, the sonar drone could give bubbleheads a new advantage at a time when Russia and China are copying our old ones. But there are plenty of technical and tactical hurdles to overcome. The first is cramming a sufficiently high-powered sonar, an underwater datalink, and an adequate power source in a drone small enough to launch from a torpedo tube. If you can do all that, then you have to make sure the sonar and datalink aren’t too powerful, or they’ll give away the drone’s location — or even help the enemy find the manned

submarine itself.

Known as MOCCA (Mobile Offboard Clandestine Communications & Approach), the sonar UUV would help the manned mothership detect enemy submarines at greater distances, without being detected in return. Active sonar, which sends out a pulse of sound — that loud “PING” you hear in war movies — has a much longer range than passive sonar, which merely listens. But submarines generally rely on passive sensors, because the enemy can home in on active pulses. If the sub can launch an unmanned underwater vehicle with active sonar, though, the UUV can move a safe distance away before it starts pinging. Yes, the enemy may well detect the drone, but even if they destroy it, the manned sub is safe.

The relationship between sub and drone would be a bit like that between a hunter and his hound, working together to find prey. But in this hunt, though, the prey shoot back. The hope is they shoot the noisy hound instead of the quiet hunter. The danger is the hound will give the hunter away.

How? One danger is that the UUV’s active sonar pulse might hit its parent submarine, echoing off and effectively spotlighting it for the enemy. While you would never intentionally aim your sonar at a friendly sub, sound bends and bounces in funny ways underwater. “Sound that is projected will be scattered,” warns DARPA’s Broad Agency Announcement outlining the problem. “Scattered sound may inadvertently illuminate the host submarine and possibly compromise stealth.”

The other danger is the datalink. The manned submarine and the UUV have to communicate, if only so they know where the other one is. The more data they exchange — the humans sending orders to the drone, the drone sending scouting reports back — the more transmissions there are to detect. Submarines traditionally operate alone precisely because coordination requires communication, and communication can be detected. As the BAA puts it, “the MOCCA communications link cannot degrade submarine stealth.”

“Underwater data links are a relatively mature technology. The challenge here is to create one that can provide high bandwidth if the UUV needs to send data to the submarine and can also be hard for an enemy to detect,” said Bryan Clark, a retired submariner and former aide to the Chief of Naval Operations, now the Center for Strategic & Budgetary Assessments. (Clark wrote an intriguing study on underwater communications). The crucial question is how much bandwidth you want, which in turn depends on what, exactly, you want the drone to do. There are two basic approaches, Clark told me:

The unmanned underwater vehicle has an active sonar transmitter, but only the manned submarine has a receiver. This basically splits the sonar in two. The UUV is just sending out the ping, not listening for the echoes. That means it’s not collecting any data, which means it doesn’t need to transmit much. This is the stealthier approach — but it forgoes the opportunity of using the UUV as a second sensor platform to look at things from a different angle.

The UUV has both a sonar transmitter and a receiver. The submarine’s passive sensors can still listen for the echoes from the UUV’s pings, but now the UUV is listening too, providing a second chance to pick up faint signals and a second perspective to triangulate a signal’s source. The problem is now the UUV has to transmit all this information back to the manned submarine. This approach is more likely to see the enemy coming, but it’s also more likely to be seen.

“If the UUV just transmits active sonar and other platforms listen to the reflections from the sonar, the datalink only needs to be able to control the UUV and provide feedback on its location,” Clark said. “If the UUV is also acting as a sensor, much more bandwidth is needed, (and) as bandwidth goes up, the required power level probably rises and could make the link more detectable.”

Clark still firmly believes underwater drones are central to the future of naval warfare: He just never said developing the technology or the tactics would be easy. “Overall, the idea of using UUVs as adjuncts to submarines or surface ships in Anti-Submarine Warfare to be sensors...is a good one,” he told me. “The key is coming up with tactics and applications where they offer better performance than the traditional approaches we use today.”

The DARPA contract starts us down that road.

[The Interesting Engineering Behind Submarines](#) [Maverick Baker, Interesting Engineering, July 19](#)

As far as recent records indicate, humans have only been exploring deep below the surface in the last few hundred years. Although it is heavily disputed as to when the first submarine was made, many owe the title out to Cornelis Drebbel, a Dutch inventor acclaimed to have invented the world’s first navigable submarine in

1620. Since, submarines have improved in mobility, strength, and stealth – some of which are capable of remaining submerged for up to three months underwater. Here is the interesting engineering of some of the world's most advanced submarines.

The Interesting Engineering of Submarines

Only a select few have descended into the deepest part of the world's oceans called the Mariana Trench. In fact, more people have explored the moon compared to those who have conquered the absolute deepest spot on Earth deemed the Challenger Deep. The first people to ever descend to the bottom of the Challenger Deep are hydronauts Don Walsh and Jacques Piccard. The team sunk their submersible, the Bathyscaphe Trieste, to the bottom of the ocean in 1960.

The Bathyscaphe Trieste

The bathyscaphe vessel dives below the surface and is supported by a surface float, instead of a crew. Previously, propelled deep sea submersibles were supported by a float that remains at the surface of the water. Its cabin is narrow and small with just enough room for a two person crew. The rest of the hull is taken up by scientific equipment used to investigate one of the world's most hostile regions on the planet, the bottom of the ocean.

Since the two hydronauts explored the bottom of the trench in 1960, only a handful of humans have gone back.

The Challenger Deep speaks for one of the most difficult challenges engineers face – pressure and life support.

High pressures threaten to crumple the hull of any vessel. For every 10 meters of water descended the pressure goes up by an entire atmosphere. That is the same amount of pressure experienced on the surface of an object from the entire weight of the atmosphere from sea level, all the way up until the reaches of space. At the bottom of the Challenger Deep, the pressure exceeds 1000 atmospheres (over 1500 PSI).

Only small spherical vessels can withstand the intense pressures at the bottom of the ocean. Manned submarines tend not to sink farther than one kilometer below the surface of the water. Modern submarines can operate independently and support a crew for weeks on end. The most advanced nuclear submarines can operate independently and supply the crew with life-support systems for months on end.

There are many types of submarines, some of which are electric, diesel, or nuclear powered. There is a large misconception that diesel engines directly power the propellers of a sub. Many people question how a diesel engine could possibly run underwater with enough oxygen for it and the crew, while somehow hiding the exhaust as well. Solving the problem is a much more trivial solution, not using the engine underwater at all.

How Crews and Engines Breathe Underwater

The solution to keeping a diesel supplied with enough oxygen is simple. Diesel powered submarines are typically hybrids. The diesel engine typically powers a generator which powers a battery pack. But the engine is only used while the submarine is surfaced. When the batteries run low, the submarine resurfaces and runs its engines to power its battery.

Carrying oxygen on board is the simple solution. Massive canisters are pumped full of air every time the submarine resurfaces. The system is fine for missions no longer than a month. However, governments are always pushing the bounds of naval capabilities. Most of the time, stealth is the number one consideration.

While submerged in water, the vehicle is hidden, on the surface of the water, however, a submarine becomes a sitting duck.

Of course, the problem remains – surfacing submarines and making them vulnerable.

For electric and diesel powered subs, the problem of oxygen still persists.

The solution does exist – electrolysis – the process of splitting water into hydrogen and oxygen using electricity. Unfortunately for fully electric and diesel subs, splitting water is too power intensive for their reserved power supply. Electric and diesel powered subs simply do not carry enough energy on board to provide enough oxygen for the crew for extended periods of time. The process drains the batteries that drive the motor, forcing the vessel to surface, defeating the purpose entirely.

Electrolysis

Electrolysis is typically reserved for the largest and most advanced subs – nuclear submarines. The process works by passing an electric current through water. The electricity provides the energy necessary to split the bonds of water, or H₂O.

In a typical day, one person will consume about a kilogram of oxygen, along with a concoction of mostly

inert gasses. Commercial electrolysis systems typically require approximately 50 kilowatt-hours of power to produce 1 kg of H₂ and 8 kg of O₂ from 9 kg of water. Instead of constantly draining batteries, nuclear submarines provide a constant source of power – enough to power a small city.

The system supplies more than enough oxygen, incidentally, hydrogen is made in the process. In normal operation, nuclear subs disperse the hydrogen directly into the water. However, during covert operations, secret methods are used to scrub the hydrogen from the exhaust.

Since some navies can detect the hydrogen releases in water, most scrubbing methods are kept secretive. Although, it is likely the subs use catalytic converters to add hydrogen to another compound. However, it is not the only stealth consideration submarine engineers must consider.

The Stealth Technologies of Submarines

Submarines make a ton of noise through their engines, propellers, and general operation. The noise causes vibrations which easily carry through the water for kilometers on end. Every part on a military submarine is built with the consideration of stealth. Every vibrating part is held in place with rubber mounts that actively dampen most of the vibrations. The technique works well on the outside, although it is not the only source of noise on the vessel.

Nearly all submarines are propeller driven. As the propellers cut through the water, they produce noise for a couple of reasons. One, the blades send out vibrations as they slice through the air, and two, the blades create cavitation bubbles which collapse, sending more vibrations throughout the water – as well as damaging the blade itself.

Cavitation bubbles form on the suction side of a propeller when the pressure of the water drops below the vapor pressure of water. As quick as the bubbles are produced, they almost just as quickly disappear. The bubble collapses on the propeller blade, causing them to wear down and release noise.

The noise is easily detected, therefore, it is imperative for submarine engineers to design sound suppressive blades that reduce cavitation.

Submarine engineers modify the shape of the propeller to reduce turbulence and reduce the overall noise of the blades as they slice through the water. Often times, there are four or more blades which force more water out of the way while spinning at slower speeds. The result is a propeller that does not need to spin as fast to produce the same speeds as propellers with fewer blades. Since the blades spin slower, there is less turbulence and less formation of cavitation bubbles. Sometimes, special grooves are carved into the blades which further guide the water along with as little disturbance as possible, once again reducing the formation of cavitations.

The submarine is also streamlined to direct water through the blades, reducing as much turbulence as possible. If the design is not sufficient enough, a ring or cage is sometimes installed around the propeller which guides the water through more linearly.

Other Sound Suppression Technologies

Suppressing the noise from the submarine itself is one challenge. But developing a sub capable of evading enemy sonar presents a different predicament.

Sonar is a device used to detect objects underwater. Sound pulses are emitted and a detector records any pulses that return. By determining the time it takes for a pulse to return, the distance between the detector and the object can easily be determined.

The massive hull of large submarines is hardly stealthy. As a metallic shell, the surface of a submarine readily reflects sounds, making it highly visible to enemy radar. The solution for hiding from radar comes from an unlikely source: bubbles.

Under water, air bubbles easily absorb noise. As sound waves propagate through water they slowly disperse over time. Introducing bubbles disturbs the sound, forcing it to travel through one medium to another, absorbing a little energy with each bubble.

Incoming sound vibrations collide with the bubbles, forcing the bubble to vibrate or contract and expand. The fluctuations cause the air inside to compress, creating heat. Essentially, the sound energy is converted from noise into heat.

Counter-intuitively, producing bubbles could actually disguise the sound signature of a sub. Although, it is nearly impossible to absorb all of the sound, hence why anechoic tiles were introduced.

Sound Suppressing Tiles

Lining the outskirts of modern submarines are layers of anechoic tile, a rubber material with thousands of tiny voids. The material continues the effect of bubbles in water, without the need to dispense bubbles and

reveal a position.

The material actively absorbs sonar while speakers may play predictable opposite tones to cancel some noise. Together, the two along with other technologies keep submarines hidden at all times, plotting on the floors of the ocean.

The extreme capabilities of modern engineers are the result of hundreds, if not thousands of years of trial and error. The interesting engineering of submarines keeps the crews alive, and well hidden in the most challenging of conditions. Space may be difficult, but it would seem the bottom of the ocean possesses the greatest challenge.

USS Alaska earns trophy for 'Best Ballistic Missile Submarine'

Lt. Joe Painter, Submarine Group 10, August 10

KINGS BAY, Ga. - The deputy commander of U.S. Strategic Command presented the Omaha Trophy for Best Ballistic Missile Submarine to USS Alaska (SSBN 732) at Naval Submarine Base Kings Bay on Thursday.

Vice Adm. Charles "Chas" Richard presented the trophy to the crew of Alaska and praised them for their hard work and dedication.

"You have all worked incredibly hard to bring this trophy back to the Alaska for the fifth time," said Richard.

Alaska conducted three strategic deterrent patrols for a total of 270 days at sea in 2016, including the longest continuous alert period of any unit from Kings Bay in the last four years.

"You and your families should be proud of this," said Richard. "You provide an invaluable asset to the U.S.'s strategic forces."

Alaska competed against the Navy's 13 other Ohio-class SSBNs to earn the 2016 Omaha Trophy.

The Omaha Trophy was created in 1971 by the citizens of Omaha through the Strategic Air Command's Consultation Committee and Cast by Tiffany and Company of New York City. STRATCOM awards the Omaha Trophy annually to U.S. military units who demonstrate the highest standards of performance in five official categories: Global Operations, Intercontinental Ballistic Missile, Strategic Aircraft Operations, Ballistic Missile Submarine and Strategic Bomber Operations.

In addition to the 2016 Omaha Trophy award, USS Alaska also earned the 2016 Battle Efficiency, or Battle "E," award for the best command in Submarine Squadron 20.

Commissioned in 1986, USS Alaska is the fourth Navy ship to be named for the Territory or State of Alaska.

Submarine Squadron 20 Changes Command

MC2 Bradley Gee, Navy.mil, August 14

KINGS BAY, Ga. – Submarine Squadron 20 held a change-of-command ceremony at the chapel aboard Naval Submarine Base Kings Bay, Aug. 11.

Capt. Bob Wirth relieved Thomas R. Buchanan as the Submarine Squadron 20 commodore.

Rear Adm. Randy B Crites, Commander, Submarine Group 10, was the guest speaker for the ceremony. During his remarks, he commended Buchanan for his outstanding performance as Squadron 20's commodore. "Commodore Buchanan, your performance as commander of Submarine Squadron 20 has been superb," said Crites. "I cannot emphasize how vitally important the work is that we do here and the Submarine Squadron 20 under Commodore Buchanan's leadership is squarely at the center of this impressive mission that is absolutely foundational to our survival as a nation."

Buchanan, a native of Vallejo, Calif., credited the personnel at Kings Bay for his successful tour as Squadron 20's commodore.

"No other location in our great nation has contributed more to ensure world peace than this little southeast corner of Georgia, said Buchanan. "I can say without a shadow of a doubt that this particular commodore job is the best kept secret in the submarine force."

Crites awarded Buchanan with the Legion of Merit for his service as commodore.

Wirth, a Grand Island, New York native, took command of Submarine Squadron 20, which is responsible for the maintenance and operations of five Ohio-class ballistic missile submarines; USS Alaska (SSBN 732),

USS Tennessee (SSBN 734), USS West Virginia (SSBN 736), USS Maryland (SSBN 738) and USS Wyoming (SSBN 742).

"It is a great honor to be here today with all of you and to be back in St. Marys," Wirth said. Working together with team Kings Bay to support, serve and lead our Sailors in our nation's most important mission."

Buchanan will report to the Joint Chiefs of Staff in Washington for his new assignment.

Russia's Ministry of Defense Confirms Construction of 2 Advanced Attack Subs

Franz-Stefan Gady, *The Diplomat*, August 15

The Russian Ministry of Defense has confirmed the expected delivery date of two new Project 636.3 Kilo-class (aka Vashavyanka-class) diesel-electric attack submarines in a August 14 statement. "Two Project 636.6 Varshavyanka-class diesel-electric submarines named Petropavlovsk-Kanchatsky and Volkhov will be added to the Russian navy by the end of 2020, provided that their in-plant and state tests go well," the statement reads.

As I reported earlier this month, the two new submarines are destined for Russia's Pacific Fleet. The two boats were laid down at the Admiralty shipyards in Saint Petersburg on July 28 in the presence of Russian Deputy Defense Minister Yuri Borisov. The first submarine will likely be delivered to the Pacific Fleet in 2019 with the second boat expected to arrive in the Russian Far East the following year.

"The decision to accelerate the construction of Kilo-class subs was partially made due to delays in the Project 677 Lada-class diesel-electric attack submarine program," I reported earlier this month. "Although, the Russian Navy expected to operate three Lada-class subs by the end of 2018, so far only the lead boat of the class has entered service and is currently undergoing operational testing."

The Project 636.3 Kilo-class is an improved variant of the original Project 877 Kilo-class design (nicknamed "Black Holes" by the U.S. Navy). The updated version is slightly longer in length, and features improved engines and noise reduction technology. Project 636.6 boats are also extremely quiet. Among other things, the sub features a special anechoic coating applied on the outer hull surface to reduce noise emanating from the boat's interior. Furthermore, the sub's main propulsion plant is isolated on a rubber base preventing vibrations that can be picked up by enemy submarines.

The submarine's range is over 7,500 nautical miles and it can stay submerged for almost two weeks. It can operate for up to 45 days before needing to be resupplied. However, the sub still lacks an air-independent propulsion (AIP) system. Russia has so far not successfully tested an AIP system aboard a submarine. According to experts, the first AIP system for Russian subs will not be available for testing until 2021-2022.

The improved Kilo-class can fire both torpedoes and cruise missiles, launched from one of six 533 millimeter torpedo tubes. Project 636.3 Kilo-class subs have been primarily designed for anti-submarine and anti-surface ship warfare. However, over the past two years, Project 636.3 subs have repeatedly attacked land targets with M-54 Kalibr (NATO designation: SS-N-27A "Sizzler") cruise missiles in Syria.