

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



The Silent Sentinel *October 2017*



Our Creed and Purpose

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

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

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



Things that ruin a submariner's day

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The Silent Sentinel via Email

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

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

NAME: _____

ADDRESS: _____

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Would like the SILENT SENTINEL emailed: YES _____ NO _____

USSVI Base Commander
c/o VFW Post 3787
4370 Twain Ave.
San Diego, CA 92120-3404

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

October Meeting

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

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

Binnacle List

*Harry Humpreville, Frank Walker, Glen Gerbrand, Ron Gorence,
Everett Mauger, and Marie Tate (Wife of WWII VET Charlie)*

Submarine Losses in October

Originally Compiled by C J Glassford



USS Seawolf (SS-197)

Lost on Oct 3, 1944 with the loss of 83 officers and men and 17 US Army troops when she was sunk just north of Moritai by USS Rowell, a Destroyer Escort (DE). In this tragic error, Rowell mistook Seawolf for a Japanese submarine that had just sunk another Destroyer. Seawolf ranks 7th for enemy ships sunk.

USS S-44 (SS-155)

Lost on Oct 7, 1943 with the loss of 56 men when it was sunk off Paramushiru, Kuriles. S-44 was on her 5th war patrol after attacking a target thought to be a merchant on the surface, S-44 found herself in a losing gun battle with a heavily armed Japanese destroyer. Two men were taken prisoner and survived the war.

USS Wahoo (SS-238)

Lost on Oct 11, 1943 with the loss of 80 men near La Perouse Strait. Under command of one of the great sub skippers of World War II, LCDR "Mush" Morton, Wahoo was on her 7th war patrol. Wahoo had won a Presidential Unit Citation and ranks 5th in the number of enemy ships sunk. She was lost to depth charges dropped by a Japanese patrol aircraft.

USS Dorado (SS-248)

Lost on Oct 12, 1943 with the loss of 77 men when she was sunk in the western Atlantic near Cuba. Newly commissioned, she had departed New London and was enroute to Panama. She may have been sunk by a U.S. patrol plane that received faulty instructions regarding bombing restriction areas or a German U-boat that was in the vicinity.

USS Escolar (SS-294)

Lost on Oct 17, 1944 with the loss of 82 men. She was on her 1st war patrol and was most likely lost to a mine somewhere in the Yellow Sea.

USS Shark II (SS-314)

Lost on Oct 24, 1944 with the loss of 87 men when she was sunk near Hainan. The second boat to carry this name during World War II, she was on her 3rd war patrol. Shark was sunk by escorts after attacking and sinking a lone freighter. Compounding the tragedy, it turned out that the freighter had 1,800 U.S. POW's on board.

USS Darter (SS-227)

Lost on Oct 24, 1944 when she became grounded on Bombay Shoal off Palawan and was then destroyed to prevent her falling into enemy hands intact. The entire crew was rescued by USS Dace. Winner of one Navy Unit Commendation, Darter had sunk a heavy cruiser and damaged another and went aground while attempting an "end around" on an enemy formation in hopes of getting in an attack on a battleship.

USS Tang (SS-306)

Lost on Oct 25, 1944 with the loss of 78 men in the Formosa Strait. Tang was on her 5th war patrol. Tang ranks 2nd in the number of ships sunk and 4th in tonnage, and had won two Presidential Unit Citations. During a daring night surface attack, Tang was lost to a circular run by one of her own torpedoes. Nine of the crew were taken prisoner, including CDR. O'Kane and five who had gained the surface from her final resting place 180 feet below. All survived the war, and CDR O'Kane was awarded the Congressional Medal of Honor.

USS O-5 (SS-66)

Lost on October 29, 1923 with the loss of 3 men when rammed and sunk by SS Abangarez off the Panama Canal.



***San Diego Base, United States Submarine Veterans Inc.
Minutes of Meeting - 12 September 2017
At VFW Hall, 4370 Twain Avenue, San Diego CA 92120***

1903- Base Commander Warren Branges called the meeting to order.

Conducted Opening Exercises - Pledge of Allegiance lead by Past Commander Fred Fomby

Acting Chaplain David Ball lead the prayer.

Acting Chaplain David Ball conducted Tolling of the Boats for boats lost in the month of September.

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

Base Secretary Jack Kane announced 19 members 1 Guest present.

Base Treasurer Joe Peluso gave his report. A copy of the Treasurers Report will filed with these minutes.

Minutes of August meetings were published in the Sentinel. One addition to the minutes was noted and will be added. Associate

Member Phillip J. L. Richeson was the guest bellringer. He used his grandfather Phill's ship's bell for the Tolling of the Bells Ceremony at the August Meeting.

Base Commander Warren Branges called for Committee Reports

Binnacle List - Acting Chaplain David Ball Reported Harry Humpreville, Glen Gerbrand and Rocky Rockers Binnacle.

Parade Committee - Chairman Joel Eikam was not in attendance. Base Commander Warren Branges noted the Next Parade is 21 October in Borrego Springs. Last Parade of the year will be San Diego Veterans Day Parade on 11 November.

Membership Committee - Chairman Ray Febrache. We have currently have 255 base members.

Scholarship Committee - Committee Chairman Paul Hitchcock noted that \$500 scholarships were awarded to Natalie Clem, Ryan Lynch and Emily Paynor. Thank you notes have been received from two of the three.

Storekeeper - Paul Hitchcock has volunteered to become Storekeeper. Base Commander Warren Branges and Past Commander Bob Bissonnette will meet with Paul to inventory all current Storekeeper holdings for turnover to Paul.

Breakfast Committee - Chair Base Commander Warren Branges. Next Breakfast is 29 October. We need maximum participation as Warren will be attending the USS TUNNEY Reunion that day.

52 Boat Memorial - Chair Base Commander Warren Branges- The City will start landscaping in October/November. Bushes will be placed near each plaque to minimize inadvertent damage to each. Some volunteer labor may be needed to help with the plantings. More info at next meeting. The next "ALL FLAGS DAY" - will be 15 September 2017, POW MIA Day.

Float Committee - Chair David Kauppinen - No Report.

Eagle Scout Program - Nihil Smith and Glenn Gerbrand. No Report.

1920 - Base Commander called for a break. 50/50 Raffle held.

1930 - Unfinished Business

Baja Fishing Trip Fund Raiser - David Ball reported 30+ tickets sold. Anyone who needs tickets see David. We need to sell 200+ more tickets. Recap of Fund Raiser. 300 tickets @ \$10 per ticket. First Prize 2 Day Baja Fishing Trip with 3 day stay at Old Mill Hotel in San Quintin Baja or \$500. 2nd Place - Prize not claimed by 1st Place winner. 3rd Place \$100.

Base Commander Warren Branges and WRD Bob Bissonnette reported on last week's National Convention in Orlando.

- Venue - The turnout was poor. Attendance was right at 400. USSVI will lose some money. The Hotel is a First Class Operation. The ownership and management are veteran oriented. Costs are about 50% of comparable hotels in Orlando. The food was excellent.
- Business Meeting - A new business model is slowly emerging for USSVI. We have outgrown the original model setup in the 1960's. The organizations net worth was cited as one reason we need a newer business model.
- Membership - A new initiative was passed to try to boost membership. Active Duty Submariners will be offered a one year complimentary national membership. That year will include an electronic copy of the American Submariner.
- Next Convention - The Convention/National Meeting in 2018 will be a Caribbean Cruise from Fort Lauderdale. Promotional Materials are being sent to each Base. (Warren will give a separate presentation later in the meeting). The National Convention in 2019 will be in Austin TX.
- American Submariner costs were down a little from last year. Anyone who can get along with just an e-version is encouraged to drop their mailed copy. National is working on reciprocal ads with Navy Submarine League.
- IRS War Veterans Organization Status - We are 130 members short of the membership mix to qualify for War Veterans Organization Status with the IRS. We do qualify as a Tax-Exempt Veterans Organization. (The organization does not pay taxes). When our membership reaches 90% War Veterans we get the added benefit that all contributions to USSVI are tax deductible.
- Reno Convention - The funds generated and added to Reno Base coffers was significant.
- WEBSITE. The new USSVI National Website is in final Testing, should be up soon. DECKLOG.COM will be part of the new site. Training Modules will be available on-line on how to use the site.

Annual Christmas Party - Will be held at the VFW Hall, 4370 Twain Avenue, San Diego on Saturday, 2 December 2017. Meals will be Pork Chops or Cornish Hens. Admission will be by tickets. Each ticket is \$20.00. Ticket should be available by mid-October. More information at future meetings. Base Commander Warren Branges will handle the ticket sales.

Upcoming Parades 2017 and 2018 - Two parades remain for 2017. Borrego Springs and San Diego Veterans Day Parade. Base Commander noted that we will need to take a hard look at the Parade Schedule for 2018. We are quickly coming to a point where transportation, repairs, maintenance, storage and liability insurance for the float needs to be addressed. We may want to look at reducing the number of parades we attend in 2018.

2010 - New Business

2018 Convention Cruise Brief - Base Commander Warren Branges gave a Power-Point briefing about the National Convention Caribbean Cruise from 21-28 October 2018. The last Cruise/Convention was 2007. It was a great success. The Cruise will be coordinated by the same AAA Group Coordinators - Kim Hedges and Amy Ross who worked the 2007 Convention. The Cruise will go to Half Moon Cay, Ocho Rios, Grand Cayman and Cozumel. Base Commander answered many questions about the Cruise. A copy of the Cruise Information is filed with these minutes.

November Meeting. The Base Commander Warren Branges suggested that we try holding one or two Base Meetings a year at a different venue with a different format. A suggested format would be to have the meeting on a Saturday morning as a Breakfast/Brunch with the meeting to follow. A preliminary show of hands at the August meeting indicated enough interest to hold the November meeting as a Brunch. A motion was made to hold the November as a Breakfast/Brunch. The motion passed. The Base

Commander will contact Julie Biewer who volunteered to find a venue. The November meeting will be held on Saturday, 18 November pending availability of a suitable venue. More details will be available at the October meeting.

Veterans Walk in Chula Vista. We have participated in the Chula Vista Veterans Walk the last few years. No information has been forwarded about the walk. We will have more information about the walk at the next meeting. Paul Hitchcock will find out if the Walk is happening or not.

Hurricane Relief Fund. USSVI National has started a Hurricane Relief Fund. The Brotherhood Fund will match individual Base contributions. Contributions will be accepted after the meeting. Don Mathiowetz donated his 50/50 winnings to the fund.

USSVI National is also taking donations for the Scorpion 2018 Memorial. Each Base is asked to donate \$99. National is donating \$999.

2020 - Good of the Order

Former Base Commander Fred Fomby suggested we setup a computer at the next meeting so everyone can check their profile in the National Database. Base Secretary will setup a laptop and we try to look up each member's data.

The Meeting was adjourned at 2050.

/s/ Jack E. Kane
Jack Kane, Secretary

Sailing List for 12 Sep 2017

Members

Fred Fomby
Jack Kane
Ed Farley
Joe Peluso
David Ball
Michael Hyman
Warren Branges

Matt Baumann
Bob Farrell
Joseph DuBois
Paul Hitchcock
Chris Stafford
Dennis Mortensen
Peter Lary
Clancy Sloan

Rus Stoddard
Bob Bissonette
Don Mathiowetz
Richard Vannoy

Guest

Jessie Farley

Current News

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

Navy to Commission Submarine Washington Department of Defense, Navy.mil, October 5

WASHINGTON – The Navy will commission its newest fast attack submarine, the future USS Washington (SSN 787), during an 11 a.m. EDT ceremony Saturday, Oct. 7, 2017, at Naval Station Norfolk.

Mr. Thomas Dee, performing the duties of the Under Secretary of the Navy, will deliver the ceremony's principal address. The submarine's sponsor is Elisabeth Mabus, daughter of the 75th Secretary of the Navy Ray Mabus. In a time-honored Navy tradition, she will give the order to "man our ship and bring her to life!"

"The future USS Washington is among the most technologically advanced platforms in the world," Dee said. "This submarine not only represents the spirit, ingenuity and strength of the American people, but also recognizes the critical role that the State of Washington provides to our national security. I am grateful to the men and women of Newport News Shipbuilding and to all of their partners for delivering such an extraordinary capability that will ensure our future advantage over any potential adversaries."

The future Washington is the 14th Virginia-class nuclear submarine and the fourth Virginia-class Block III submarine. The ship began construction in 2011. The future Washington will be the third U.S. Navy ship to be commissioned with a name honoring the State of Washington. The first was an armored cruiser (ACR-11) which served under the name from 1905 to 1916 and the second was a battleship (BB-56) that earned 13 battle stars for World War II service before being decommissioned in 1947.

Block III Virginia-class submarines feature a redesigned bow, which replaces 12 individual launch tubes with two large-diameter Virginia Payload Tubes, each capable of launching six Tomahawk cruise missiles.

Virginia-class submarines are built to operate in the world's littoral and deep waters while conducting anti-submarine warfare; anti-surface ship warfare; strike warfare; special operation forces support; intelligence, surveillance, and reconnaissance; irregular warfare; and mine warfare missions. Their inherent stealth, endurance, mobility, and firepower directly enable them to support five of the six maritime strategy core capabilities - sea control, power projection, forward presence, maritime security, and deterrence.

Chinese Rescue Submersible Attaches To Foreign Submarine During Exercise Andrew Tate, Jane's 360, October 3

The second phase of the 'Joint Sea 2017' Sino-Russian exercise conducted the first underwater mating of a People's Liberation Army Navy (PLAN) rescue vehicle with a submarine from a foreign navy.

During the exercise, which took place from 18 to 22 September in the Sea of Okhotsk and followed preparatory briefings in the Russian Naval base in Vladivostok, the PLAN's LR7 rescue submersible attached itself underwater to a Russian submarine simulating a disabled boat on the sea bed, according to Chinese news reports.

It is likely that a Russian Kilo-class boat simulated the distressed submarine (DISSUB), with media reports implying that it was bottomed in 80 m of water.

For the submarine rescue exercise, the Russian Federation Navy (RFN) tasked the Project 21300 rescue ship Igor Belousov, which deployed the Project 18270 rescue submersible AS-40. Igor Belousov entered service in 2015 and is operated by the RFN's Pacific Fleet.

The PLAN deployed the Dalao-class (Type 926) submarine rescue auxiliary (ASR) ship, Changdao, which is one of three 9,500 tonne Type 926 ships commissioned by the PLAN since 2010 specifically designed to support submarine rescue submersibles.

The Type 926 is operated as mothership for the LR7 rescue submersible, which was built by UK company Perry Slingsby Systems and entered service in 2010. The LR7 has the capacity to transfer 18 crew from a DISSUB to the mothership, and can operate for about 12 hours before needing to be recharged. The media reports state that the mating exercise was completed in about an hour.

Navy Accelerates Orca Undersea Drone Program Ross Wilker, Defense Systems, October 3

The Navy has narrowed the field of competitors for one of its unmanned underwater drone programs to a Boeing-Huntington Ingalls team and Lockheed Martin team amid expectations of increased spending in that area.

Both parties received contracts to embark on design efforts for phase one of the "Orca" Extra Large Unmanned Undersea Vehicle program, the Defense Department said in its Thursday contracts digest. The Navy received three bids and awardees will also work to deliver a technical data package with their vehicles.

Boeing is the prime contractor in its partnership with military shipbuilder Huntington Ingalls and received a \$42.2 million phase one award, while Lockheed was awarded \$43.1 million. The Navy is obligating \$16.5 million in initial funds to both parties at the time of award and expects all contract work to complete by December 2018.

The Navy intends to downselect to a final winner for Orca by the end of calendar year 2018, or the first quarter of the government's 2019 fiscal year, a Navy spokesperson told Washington Technology. The winning company will build up to five vehicles under the downselect contract, the spokesperson said.

The Boeing-HII team is offering the former's 55-foot-long Echo Voyager vehicle in pursuit of the Orca program, Boeing's autonomous systems unit leader Chris Raymond told Washington Technology in August. Boeing has made the unmanned undersea domain a growth priority through its acquisition of California-based drone maker Liquid Robotics in December 2016 and the partnership with HII announced in June.

Lockheed has also made forays into unmanned undersea technologies as the defense contractor's venture capital arm disclosed earlier this month an investment in San Diego-based Ocean Aero, another maker of underwater drones. Ocean Aero's Submaran S10 model is about 13 feet long and 8 feet high at a weight of 280 pounds.

Boeing and Lockheed are not the only large defense primes to identify unmanned underwater platforms as an avenue for growth. General Dynamics and L3 Technologies also have acquired undersea drone makers over the past year-and-a-half. The U.S. military has plans to invest as much as \$3 billion into undersea systems over the coming years, the Washington Post reported last year.

Through Orca, the Navy is seeking a reconfigurable underwater drone with a modular and open architecture that can travel to a location, loiter and periodically establish communications. The vehicle should also be able to deploy payloads and subsequently return to its host, according to a solicitation for Orca in March.

Orca's dimension requirements have the modular payload bay or bays of at least 60 inches in height, 125 inches in length and total volume of 325 feet.

***South Korea Has Design For Nuke Submarine Reactor
Staff, Asia Times, October 4***

South Korea has a design for nuke reactor ready if the Moon Jae-in government goes ahead with plans to build a domestically produced nuclear submarine.

The Korea Times quoted military officials as saying earlier this week that a preliminary sketch has been drawn up for a 4,000-ton nuclear-powered submarine.

Moon's government is reportedly negotiating with Washington to build the country's own nuclear-powered submarines in response to an evolving North Korean nuclear threat.

The officials said scientists at the Agency for Defense Development, which is under the wing of the Ministry of National Defense, completed the design for a nuclear reactor three years ago.

The Korea Times says this indicates the military is ready to create a nuclear submarine prototype if the Moon government finishes negotiating with the US.

"The country is virtually ready to work on the detailed design of the reactor and make it once relevant policies are finalized," an official said. "Production is estimated to take three to five years. It will require consent from the US on having South Korea use uranium enriched up to 20 percent as the source for the submarine's reactor."

Production is scheduled to start from 2020 at the federal government-owned shipyard in Osborne South Australia.

***U.S. Nuclear Weapons Modernization Continues;
Lockheed Martin To Build Submarine Ballistic Missiles
John Keller, Military and Aerospace, October 2***

U.S. military leaders are moving forward toward their goal of modernizing the U.S. nuclear weapons arsenal with a nearly half-billion-dollar deal to Lockheed Martin Corp. on Friday to build new submarine-launched ballistic missiles.

Officials of the U.S. Navy Strategic Systems Programs (SSP) office in Washington awarded a \$418.7 million order the Lockheed Martin Space Systems segment in Sunnyvale, Calif., to provide new procurement of Trident II (D5) missile production and D5 deployed systems support.

The UGM-133A Trident II D5 submarine-launched ballistic missiles support the U.S. sea-based atomic missile infrastructure. President Donald Trump has said one of his highest military priorities is to revitalize the nation's nuclear forces.

Friday's contract modification consists of new Trident II D5 procurement, D5 life extension production, and D5 deployed systems support.

The Trident II D5 is one of the most advanced long-range submarine-launched nuclear missiles in the world. It is the primary U.S. sea-based nuclear ballistic missile, and is deployed aboard U.S. Navy Ohio-class ballistic missile submarines.

The U.S. Navy operates 14 of these ballistic missile submarines, each of which can carry as many as 24 Trident II missiles. Although the Trident II is designed to carry as many as 12 multiple independently targetable reentry vehicle (MIRV) warheads, current treaties reduce this number to four or five.

Each Trident II missile has a range of 4,000 to 7,000 miles. The Trident II D5 was first deployed in 1990 and is scheduled to remain in service until at least 2027.

The Navy started the D5 Life Extension Program in 2002 to replace obsolete components using as many commercial off-the-shelf (COTS) parts as possible to keep costs down and to enhance the missile's capability. Draper Lab is in charge of upgrading the Trident II's guidance system, and has been working on this project since 2005.

In practice, the Trident II missile's inertial measurement system receives targeting data from computers aboard the submarine. The inertial measurement unit then transmits signals to the D5 flight-control computer and converts them into steering commands to keep the ballistic missile on target.

The missile's post-boost control system maneuvers the missile in flight to observe stars for the missile's celestial navigation subsystem, which updates the inertial system in flight.

Lockheed Martin also is integrating the Trident II onto the next-generation ballistic submarine designs of the U.S. and United Kingdom by adapting the Trident II missile and reentry subsystems into the common missile compartment for the future U.S. Columbia-class Ohio replacement submarine and United Kingdom Dreadnought-class Vanguard successor submarine.

The future U.S. Columbia-class fleet ballistic missile submarine, being designed to replace the Navy's fleet of Ohio-class ballistic missile submarines, should enter service in 2031. The United Kingdom Dreadnought submarine, to replace the Royal Navy's Vanguard-class ballistic missile submarines, should enter service in 2028.

The U.S. Navy today operates 18 Ohio-class submarines -- 14 of which carry the Trident nuclear missile, and four of which have been modified to carry conventionally armed long-range cruise missiles.

The Ohio-class submarines have been in commission since 1981, and are scheduled to be decommissioned and replaced starting in 2029. The United Kingdom Vanguard-class ballistic missile submarine has been at sea since 1993. The Royal Navy operates four Vanguard-class subs.

On this contract modification Lockheed Martin will do the work in Sunnyvale, Calif.; Cape Canaveral and Orlando, Fla.; Kings Bay, Ga.; Bangor, Wash.; and Magna, Utah, and should be finished by September 2022.

Submarines: Hampton Roads' growth industry
Hugh Lessig, Daily Press, October 1

The future USS Montana is still a giant jigsaw puzzle at Newport News Shipbuilding, but the pieces are coming together.

Atop a raised platform where shipbuilders work in cramped spaces, the framework of the commander's ward room is taking shape. When finished, it will be one of the few open areas of the ship, where sailors can attend briefings, eat meals and maybe sneak in a game of cribbage, the submariner's time-honored pastime.

The general outline of the galley is a short walk away. Shipbuilders have erected walls for the mess area, where future crew members will pile into a row of tightly fitted restaurant-style booths.

Showers and berthing areas - the bunks stacked three high - are in various stages of construction.

The pieces are placed strategically throughout the Covered Module Assembly Facility (CMAF) at the Newport News yard, where Gerald Johnson is squeezing between narrow spaces.

"One of the things I've gotten excited about in my career is being able to see the construction from beginning to end," said Johnson, superintendent of Virginia class submarines. "This is really amazing. You see something like this - this is the galley under construction, and before we bring the freezer in, we have to slide all this equipment in."

It's a busy place and promises to get busier. Aircraft carriers - also built at Newport News - are the most visible symbol of Hampton Roads' naval presence, and there is talk of expanding the fleet. But the most immediate growth industry for the region's defense community might be underwater.

Virginia-class fast attack submarines are in demand by the Navy and production is humming at two boats per year. The nuclear-powered vessels are built in a 50-50 teaming arrangement between General Dynamics Electric Boat of Groton, Conn., and the Newport News shipyard, a division of Huntington Ingalls Industries.

The arrangement is unique in the defense industry - the two yards once faced off as rivals - and the Navy considers it a success. Generally, the boats have been delivered on or ahead of schedule and within budget parameters.

The Navy wants this assembly line to remain hot. That will be a challenge because of a different submarine project on the near horizon.

The Navy plans to build a new fleet of subs that carry nuclear ballistic missiles. It will order the first one in 2021, another in 2024, and one per year from 2026 through 2035, according to its 30-year shipbuilding plan for 2017. Eventually, the Navy wants a fleet of 12 of these Columbia-class boats.

Electric Boat will take on the majority of the Columbia-class work. As a result, Newport News will take on more Virginia-class work, tilting that 50-50 burden more toward Hampton Roads.

Production of Virginia-class subs will drop from two to one per year in years when the Navy orders a Columbia-class ship. But the Navy is pushing a scenario in which the two-per-year Virginia production remains constant. So in some years, the two yards might be pushing out three boats per year.

Why so many? The Navy didn't build many submarines in the 1990s, and some older Los Angeles-class subs will be retired in the coming years. Even with continued production of Virginia-class subs, the overall size of the submarine fleet is projected to drop in the late 2020s.

A July 2017 Navy report says the submarine industrial base can handle added work, but it will be a challenge. A three-per-year procurement rate "is achievable and provides significant benefit to the Navy and the (Virginia-class) force structure," the report states. "The major challenge will be the cost to procure additional attack submarines."

Another challenge: Starting in 2019, Virginia-class boats will be getting bigger. The Navy plans to add a mid-body section called a Virginia Payload Module, about 83 feet long. It will contain four large-diameter vertical launch tubes that could fire Tomahawk cruise missiles or launch unmanned underwater vehicles.

Bob Meyer, Virginia construction director of Virginia class submarines, said shipbuilders are already starting to climb the learning curve in anticipation of adding the extra section.

"It'll add excitement," said Meyer with a laugh. "But because we have people already engaged in that, it's not a big surprise."

Besides the Montana, the CMAF building contains portions of the future USS Hyman Rickover, the Vermont and the Oregon. Elsewhere in the shipyard, the Indiana is 94 percent complete. The Delaware is right behind it at 73 percent. Including early work, a total of seven or eight subs are in various stages of work at any time.

"We've been fortunate to maintain pretty much a constant workflow. That gets us in a very familiar routine of what we are doing," Johnson said. Pointing to a berthing area, he said: "We take pride that these are the living quarters. This is where the captain and the crew will spend the majority of their time."

Newer subs headed to Norfolk?

The growth of submarines isn't limited to the Peninsula. The Navy is eyeing improvements at Naval Station Norfolk to accommodate Virginia class subs.

Of the 15 Virginia-class submarines delivered to the Navy, the most recent being the USS Colorado on Sept. 21, nearly all have been parceled out to Groton and Pearl Harbor, Hawaii. But that is changing.

The USS John Warner was the first Virginia-class boat ported at Naval Station Norfolk. This coming Saturday, the Navy will commission the submarine Washington into service at Norfolk, giving Hampton Roads two of the newer subs. The base is currently home to five of the older Los Angeles-class boats.

Todd Lyman, a spokesman for Naval Facilities Engineering Command Mid-Atlantic, said upgrades will be needed. NAVAC is the command responsible for building and maintaining facilities, plus delivering utilities and services."

"We will need to replace the current submarine pier, which was originally built in 1944," Lyman said in an emailed statement. "While it is currently supporting the LA class submarines, to support more VA class, a replacement pier will need to be larger and include more modern utility systems than currently exist here. As more VA class are scheduled to homeport in Norfolk, the Navy will budget for the necessary infrastructure and those requirements will be passed to NAVFAC ..."

Complicated schedules

The shorthand for the relationship between Newport News and Electric Boat goes something like this: Both yards build portions of a Virginia-class sub, then take turns in final assembly and delivery to the Navy.

In fact, it's much more complicated than that. If a submarine requires welders, pipe fitters electricians and other trades, it also requires a choreographer.

Ultimately, construction of a Virginia-class sub comes down to four super modules: the two ends - bow and stern - plus two midbody sections. Assembling those giant pieces together requires precise coordination between the two yards.

Take the habitability module, which Johnson takes pride in. It includes the galley, mess and crew living spaces. Newport News is building it, and they'll ship it to Electric Boat, which will load it into one of the super modules and send it back. Newport News builds the bow section, but Electric Boat sends them a portion of it.

The back-and-forth barge traffic is further complicated considering the number of submarines under construction at one time, all in different stages of progress.

The idea, said Meyer, is having workers do the same job all the time.

"When we started off, we wanted to drive down cost," he said. "So we've been sending them work, they've been sending us work, trading back and forth. So we get these four large super modules."

The choreography has some flexibility, but it's still a controlled dance.

"It has to be choreographed, because you don't want them getting large sections or modules that are sitting around and waiting, and Gerald (Johnson) doesn't want material getting in here early," Meyer said. "It's really the essence of modular construction. It's getting the right components, the right pieces at the right time in the right sequence so they're ready for the next incremental phase of construction."

The shipyard is hiring, and company leaders say they are conscious of how a new generation of shipbuilders tends to think. They're less about blueprints and more about computer tablets. The Virginia Payload Module will be a "paperless" building process.

As a veteran shipbuilder, Meyer acknowledges that will be a big change for him.

"I have a love of the shipyard, so if we're going to look at where my shipyard needs to be in 10, 15, 20 years, we have to look at digital integrated shipbuilding," he said. "It is the future."

Justin Byrum, Virginia class submarines program director, gives Meyer credit for pushing the new generation of technology, and grief for still carrying a flip-phone.

"It works," Meyer shot back.

South Korea About to Make a \$7 Billion Nuclear Submarine Blunder Staff, Scout Warrior, October 1

One of the toughest challenges for military allies to sort out is a sensible division of labor when it comes to expensive high-tech weaponry. A case in point is South Korea's interest in developing extremely expensive nuclear submarines, which also raise nuclear proliferation concerns.

Although South Korea has invested heavily in conventional subs, operating eighteen of the vessels with more on the way, Yonhap News Agency recently reported, "The Moon administration is considering the acquisition of nuclear-powered submarines to counter the North's fleet of around 70 military subs, some armed with ballistic missiles." The same article noted that Seoul would require that at least one of these submarines would be operating at all times. The main rationale for acquiring nuclear subs (SSNs) is that unlike conventional submarines, which must surface every few days or weeks for air, the nuclear reactors allow SSNs to stay submerged indefinitely. This will allow them to track North Korea's emerging submarine-launched ballistic missiles.

This capability does not come cheaply. One way South Korea could acquire nuclear submarines is by buying or leasing American-built SSNs. It's unclear if this option is feasible since the United States has never sold nuclear-powered submarines to another country. Still, assuming that it is, the question becomes how much would this cost South Korea?

The Australian Strategic Policy Institute examined this question in a 2012 report by Andrew Davies. It explored how much it would cost Australia to purchase Virginia-class SSNs from the United States.

According to Davies:

[The U.S. Navy's] goal is to reduce costs to \$2.24 billion per vessel and the time required to build each ship to about 60 months. Under the US Foreign Military Sales regulations, any submarine purchased by Australia would cost a little more than the cost of production for the USN. A working figure might be US\$2.5 billion, with a lead time of at least five years, although that figure does not include the support systems, infrastructure investment and other costs that would also be incurred.

If this figure is correct, it would cost South Korea around \$7.5 billion to purchase three SSNs before accounting for the substantial operating costs, personnel training and infrastructure investments.

A more realistic option is for South Korea to build its own SSNs. South Korea already has extensive experience in building its own conventionally-powered submarines, as well as nuclear reactors. In the early 2000s, South Korea was also caught conducting research into miniaturized nuclear reactors that can fit on submarines. In fact, one atomic energy official who worked on that clandestine effort recently bragged: "South Korea's atomic energy agency finished its basic design for a nuclear reactor that can be used for a nuclear-powered submarine in 2004."

To gauge the cost of an indigenous effort, it would again be helpful to look at other countries' experiences. One potentially helpful comparison is Britain's program to build seven Astute-class SSNs. This is obviously an imperfect comparison since Britain has prior experience with SSNs and is using reactors from its older ballistic missile submarines (SSBNs) for the Astute-class subs. Nonetheless, it's a useful starting place.

The Astute-class submarines have been beset by repeated problems since the program began, including myriad operational challenges and massive cost overruns. The current cost estimate is that the seven submarines will cost \$13.3 billion, or nearly \$2 billion per ship. Even this is misleading because the unit cost is driven down by how many vessels Britain is procuring. The lead ship of the class was \$2.6 billion overbudget. Thus, an extremely optimistic estimate is that the first three ships would cost \$7 billion.

Another useful example is Brazil's efforts to acquire a nuclear attack submarine. Brazil is teaming with the French firm, DCNS, to build the SSN. According to the contract, DCNS will provide "design assistance and production of the non-nuclear part of the first Brazilian nuclear powered submarine, including support for construction of a naval base and a naval construction site." Brazil itself will provide the nuclear reactor that will power the submarine. Altogether, the SSN will cost \$2.4 billion, with about \$1.5 billion of that going to the nuclear reactor. Once again, this suggests a cost of at least \$7 billion for three South Korean SSNs.

The Brazil case is informative in another way: Brazil is also constructing a submarine pen to house and protect the nuclear-powered submarine. This is something South Korea might also need if it builds SSNs. Although Seoul recently built a new naval base in Jeju-do in part to house its conventionally-powered submarines, a hardened submarine pen to protect the SSNs would likely be necessary in light of their enormous expense and North Korea's increasingly accurate MARV (maneuverable reentry vehicle) missiles. Brazil estimates its new base will cost around \$2.1 billion.

In light of this, it is worth asking whether it would be wise for South Korea to invest \$7–9 billion in SSNs when other capabilities exist to deal with the threat of North Korea's nascent submarine-launched ballistic missiles. A number of other possibilities could be explored. For instance, South Korea could buy at least seven times as many conventional submarines as SSNs. While these individually aren't as capable as nuclear-powered submarines, quantity has a quality all its own, especially given that Seoul is facing a North Korean force of nearly eighty subs. In addition, as the National Interest has repeatedly covered over the years, there are a bunch of emerging technologies that make detecting and tracking submarines far easier than ever before. South Korea could also put more money into other anti-submarine capabilities such as the P-8A Poseidon Maritime Surveillance Aircraft. Improving missile defense is another option that should be considered.

Another advantage of these options is that they don't pose nuclear weapons proliferation concerns like the SSNs do. The nuclear reactors on these submarines would require enriched uranium. If South Korea was to buy this fuel from the United States—or Washington was to allow South Korea to enrich U.S. uranium on its territory—this would violate U.S. non-proliferation restrictions, forcing Congress and the White House to wrangle over how to rearrange the rules and for Washington to renegotiate a new nuclear cooperative agreement with Seoul. This would take time and risk encouraging other nuclear submarine aspirants, including Iran, to build their own SSNs. None of this would help strengthen U.S.-South Korean security relations at a time when that is desperately needed to confront the North Korean threat.





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