



Winter 2021

WWA REPORTER

Dedicated to the memory of the USS Woodrow Wilson
SSBN/SSN-624



Issue Number 40



Presidents Corner Winter 2021

Welcome all to the Presidents corner of the WWA 2021 winter newsletter. I come to this place not as a spectator nor reader, but the one with the responsibility of putting pen to paper. So now I will go forward with the task at hand.

This past year has been one fraught with COVID 19, isolation, stay at home orders, travel bans, illness, and the ultimate with the loss of friends and loved ones. On top of that we are also having to put up with all the other issues and problems associated with it. The future and our recovery will come, the time frame is the major question, so in the meantime we must hurry up and weight! and look to staying safe and out of harm's way.

The passing of our President Russ Johnston (not COVID-19 related) left me in the unexpected position as the new President of the WWA I was quite content serving as the WWA VP, and a reunion coordinator and having served in these positions since the 2016 Charleston reunion. During the intervening time between the Charleston reunion and now, I arranged the 2020 Washington DC reunion, renegotiated that reunion move to 2021 and then finding that we would have little chance of having a success in 2021, renegotiated the cancellation, without penalty. This will allow us to investigate alternatives when the pandemic abates, and things return to some form of normal.

I must digress and offer the fact that I had known Russ Johnston our former President since the first WW overhaul in 1968, where he was my mentor and he in fact qualified me on my first watch station on the WW. I should also note I assumed the VP position primarily because Russ asked me to, so now we must contemplate what is next for the WWA, while we sit out and wait for the Pandemic to abate. Going forward, I note with my moving up to the President's position, the VP slot was open, and Richard Stepp has assumed this position. Rich was a MM1 SS onboard the WW Gold from 1971 thru 1976 Rich has also expressed interest in becoming a reunion coordinator. Rich's stepping up to the VP position will take us forward while we hurry up and wait for the COVID 19 issue resolves itself and we can make new plans going forward. Now I ask one and all to wish Rich the best of luck.

I wish my portion of the newsletter were full of good stories, comments on or about our now cancelled reunion, news of the future and happy thoughts, but staying home and out of harm's way makes jack a dull boy! So, until next time stay safe and out of harm's way.

Regards, Wayne Gray MMI SS 68-72

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The WWA has always worked on a “voluntary” basis and the same shipmates have setup and run the Reunions. Now we are to the point that most of the Reunion Coordinators are getting “long of tooth” and need to turn over the watch to some new and “younger” shipmates. Now that we have cancelled the Washington DC Reunion, any Reunions in the future will be dictated by the Covid travel and Hospitality restrictions. We’d like to have one more Reunion and that will probably be the “Last one”. At the moment we are just waiting to see how the Covid situation evolves. We plan on maintaining the Web Page and the New Group. The Ships Store will be iffy till the inventory gets straightened out.

Dennis Morgan, Email: morgand004@hawaii.rr.com. Tel: (808) 393-8930

Words From Your Secretary
Aloha Shipmates!

Happy New Year to all my Shipmates and their families! I hope that 2021 will bring better times than most of us may have experienced in 2020!

Here in Hawaii, things remain difficult for many. However, the State has figured out a series of wickets for tourists to navigate in order to return to Hawaii and enjoy the weather and hospitality! That's a good thing for the local businesses and hotels. Tourist arrivals are about 30-50% of the pre-Covid days. However, since Hawaii's primary industry is tourism, and for many months NO tourists were arriving here, many businesses failed; restaurants were the hardest hit. Estimates are that about 50% of restaurants in Hawaii will not reopen, having effectively been forced to go out of business. Many of them had been in business for 50 or maybe 70 years and survived many stressful times in the past, but just couldn't survive economically this time around.

Colleen and I have been well; follow the rules by wearing our masks, practicing social distancing, and washing our hands! Hey, I think it works. Even though the local guidelines suggest staying at home, we still go out to take care of business, go shopping for essentials, like food, pharmacy supplies...and beer. Some restaurants are open where seating is outdoors or at least open air and having gone to lunch a few times with my Shipyard or Hawaiian Electric friends, I felt pretty safe there. I hope wherever you are, there are similar opportunities to get out, otherwise, you may go buggy being at home for months. I tell my friends that I was trained for this at one time; I just pretend I'm on patrol! Even then, channel fever creeps in after a while so you got to chance and go out somewhere!

There has been some discussion about the status of WW Reunions in general. I'm hoping for a few more, but it likely depends on the ability for people to travel. There should be more information coming out soon as things develop; incredible number of unknowns out there at this point in time. The vaccine is a light at the end of the tunnel, and if my local politicians can get it together and stop using it as leverage, I may get mine before I die of old age! Seems like just so many people ahead of me that I never even heard of before, that have been deemed “essential”. Anyway, I'm hopeful!

I cannot close without being even more solemn about recent months. We have lost a number of our Shipmates over the last year or so; too many. All of them will be very much missed by their Shipmates, families and friends. Over the last few years, I renewed an old friendship with Russ and Dianne Johnston. He was a good man and I will miss him. Rest in peace, my friend.

Aloha and Mahalo!
Dennis Morgan

Navy fast-tracks 'on-time' delivery of nuclear-armed Columbia-class submarine

Columbia-Class Submarines are being Engineered to be Quietest, Stealthiest Submarines Ever

By Kris Osborn | [Warrior Maven](#)

Kris Osborn is the Managing Editor of [Warrior Maven](#) and The [Defense Editor of The National Interest](#)

The entire premise of undersea strategic deterrence is based on the need for nuclear-armed ballistic missile submarines to hold potential attackers at risk of catastrophic destruction, without being found, detected, or seen by enemies in any way.

This reality, which is increasingly becoming more complex for [submarine weapons](#) developers, might explain why the [Navy's](#) new Columbia-class, nuclear-armed ballistic missile submarines are being engineered to be the quietest, stealthiest submarines ... ever to exist.

The new submarines will also need to be higher tech in the sense that they will need to be less detectable, due in large measure to the reality that enemy platforms capable of submarine detection are getting much more advanced through the use of longer-range, more sensitive sonar systems, harder to detect, long-endurance, small undersea sub-hunting [drones](#) and advanced methods of aerial [submarine detection](#); some of these detection systems include the use of air-dropped sonobuoys, high-tech sub-hunting surveillance planes and other systems, including the use of surface and shallow-depth laser scanner technologies engineered to find subs on patrol. In light of this kind of global equation, it is by no means surprising that the Chief of Naval Operations Adm. Michael Gilday's CNO NAVPLAN (Navigation Plan) text [specifically cites](#) the pressing need to deliver the new Columbia-class boats ... "on time."

The rapid and large-scale proliferation of undersea drones, many of them being quite small, quiet, and less detectable by [submarine defenses](#), presents an entirely new threat calculus for submarine commanders who need to lurk quietly in undisclosed, undetectable, yet strategically vital locations.



190306-N-N0101-125 WASHINGTON (March 6, 2019) An artist rendering of the future Columbia-class ballistic missile submarines. The 12 submarines of the Columbia class are a shipbuilding priority and will replace the Ohio-class submarines reaching maximum extended service life. The Columbia-class Program Executive Office is on track to begin construction with USS Columbia (SSBN 826) in fiscal year 2021, deliver in fiscal year 2028, and on patrol in 2031. (U.S. Navy illustration/

Update: New SSBN Cont.

Also, the Chinese continue to quickly build new Jin-class, nuclear-armed ballistic missile submarines, platforms soon to be armed with JL-3 long-range nuclear weapons. These new sub-launched JL-3 missiles introduce an ability for Chinese submarines to hold larger portions of the continental U.S. at risk of a nuclear attack.

Given all this, the U.S. Navy naturally needs larger numbers of highly-capable new ballistic missile submarines, but perhaps to an even greater extent, the new submarines may need to be the stealthiest undersea platforms ever to exist. This, interestingly, may in fact be the case due to a Navy effort to integrate an entire suite of new undersea warfare technologies into the Columbia-class. These technical efforts, emerging after years of successful Navy Science and Technology work, are multi-faceted and wide-ranging, and some of them are even being migrated over to the Columbia submarines from the Navy's Block III Virginia-class attack submarines. Several attack submarine innovations are being adapted for the much larger Columbia's, to include the use of a fiber-optic periscope cable enabling commanders to view surroundings within the submarine from different locations, and essentially not have to stand just beneath a periscope dropdown. The Columbia's also incorporate fly-by-wire computerized navigation controls which, unlike a mechanical hydraulic system, draw upon advanced computer automation to control submarine settings such as depth, speed, and other mission elements, of course when directed by a commander.

It is certainly quite likely that the Columbia may incorporate many as-of-yet unknown quieting technologies. One item often discussed by senior Navy weapons developers is its electric drive technology -- the high-tech electrical propulsion system is known to be much quieter than existing technologies and also brings very crucial added amounts of mobile electrical power to the submarine, systems of great relevance given the large number of advanced electronics built into the submarine. Newer kinds of command and control, computerized or automated navigational systems, and electrically-powered weapons and sensor interfaces.

Yet another way to remain less detectable is through the use of missile-tube launched undersea reconnaissance drones. Many of these drones are now being built by the Navy to bring new launch and recover surveillance systems to undersea warfare through the use of missile tubes. The technical ability to dispatch and track unmanned sonar and underwater reconnaissance systems, increasingly able to share data in real-time with larger host submarine platforms, can enable a large Columbia class boat to linger more safely in "impossible to detect" locations, allowing forward-operating undersea drones to enter higher-risk areas to patrol for threats such as enemy subs.

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The US Navy Wants to find Ships to kill using aerial Drones Launched from Submarines

By: [David B. Larter](#) December 7, 2020

The Virginia-class attack submarine Mississippi in the Atlantic Ocean. The U.S. Navy wants to operate aerial drones launched from underwater from its submarines. (U.S. Navy photo courtesy of General Dynamics Electric Boat)



WASHINGTON – The name of the game in the Pacific is stand-off range. But with longer range torpedoes and anti-ship missiles in the arsenal, submariners are looking to a new domain to help them extend their deadly reach: The air.

In an October request for information, Naval Sea Systems Command's Submarine Combat and Weapons Control Program Office asked industry for input into a “Submarine-Launched Unmanned Aerial System,” or SLUAS, currently in development.

The Navy has been interested in sub-launched drones for some time and has been testing prototypes, but the RFI shows the service is getting serious about the idea as it adds longer-range torpedoes and anti-ship cruise missiles to the arsenal of its attack submarines.

The idea for the SLUAS is an ambitious one.

The drone would launch from a submerged submarine out of a 3-inch ejector tube used for sonobuoys, flares and countermeasures among other things. The battery-operated UAS would then deploy its wings and operate for an hour, well beyond the range visible from just the low-in-the-water periscope.

Additionally, the UAS should have an “electro-optic capability with reliable target solution analysis,” the RFI said, adding that it should be able to “operate at ranges out to the line-of-sight radio horizon, and use a variable bandwidth encrypted datalink with at least 256-bit encryption strength.

The drone should also have a degree of autonomy and “include the ability to operate in an emission-controlled environment and operate without constant radio communication links.”

“Every submarine has a 3-inch launcher, so in theory, every submarine could operate with UASs,” said Bryan Clark, a retired submarine officer and senior fellow with The Hudson Institute. “The idea is that you would be about the size of a sonobuoy — it could be pretty long — and you’d put it inside a canister. Then you launch this in a canister, it floats to the surface and the USA deploys from there.

“And from there it can either connect up with the submarine or it could connect with another unit, and it gives you the ability to have over-the-horizon surveillance.”

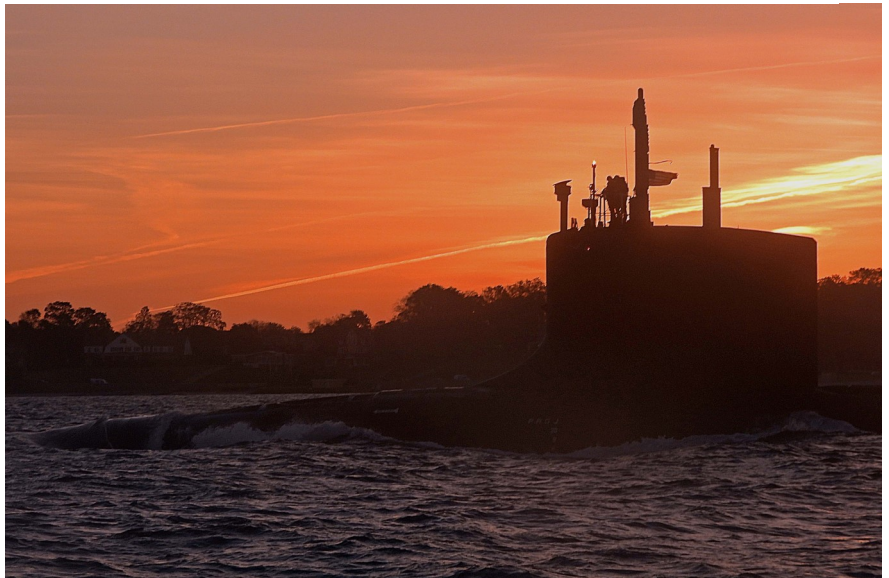
“The demonstrations have been pretty successful,” Clark added.

The responses to the RFI were due in November.

Navy New Virginia Block VI Virginia Attack Boat Will Inform SSN(X)

By: [Megan Eckstein](#) November 20, 2020 4:41 PM

USS Vermont (SSN-792) transits the Thames River while conducting routine operations on Oct. 15, 2020. US Navy Photo



The submarine community is nearing a plan for its Block VI Virginia-class submarine, which will be an improvement in stealth and capability compared to the boats under construction today and will be a bridge to the upcoming SSN(X) program.

The Block V Virginia submarines – the first three of which have already begun construction – represent the first time the Navy has made a major investment in increasing the capability of this class of ship. Whereas past blocks have focused on construction and maintenance efficiencies, and incremental capabilities are added through software updates regularly, the Block V design adds 28 more missile tubes to greatly enhance the strike capability of these SSNs, Program Executive Officer for Submarines Rear Adm. David Goggins said this week at the Naval Submarine League annual symposium. Block VI will continue that trend of adding new capability and lethality to the boats, which will be procured in a multiyear contract from Fiscal Years 2024 through 2028.

“Block VI will focus on building upon the acoustic superiority” technology that’s being built into and tested on the future *South Dakota* (SSN-790), as well as “really enable that organic subsea, seabed warfare kit release for the first time.” Specifically, he said the Navy and industry are working on improved stealth to operate in a contested environment; enhanced sonar performance through a new bow conformal array; and the ability to sense and interact with more of the water column, including the sea bed.

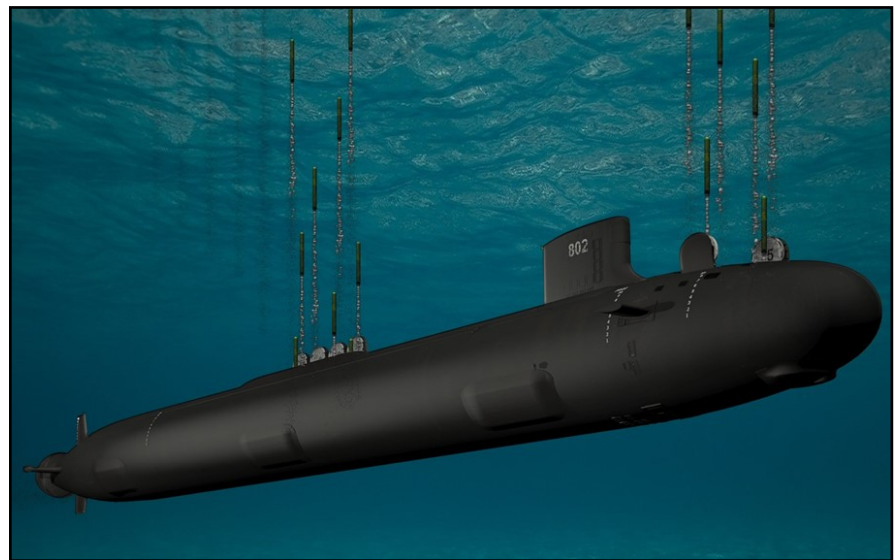
Goggins said those ideas have been chosen as priorities for Block VI for two reasons: first, they’ll improve the capability of the Virginia class in the near term, and second, they’ll help prove out technologies that could influence the next-generation SSN(X) design. “We’ll spend the next year evaluating the maturity and feasibility of these capabilities [on the slide he presented], followed by a downselect next year. And that will really allow us to mature the technology,” Goggins said. Goggins’ slide also highlighted propulsors, improved payload and vehicle hosting, improved situational awareness and additional payloads as features of the Block VI design.

Elsewhere during the Sub League event, it was clear that the rest of the submarine force is eagerly eyeing the SSN(X) program and what kinds of improvements are within the realm of the possible for that program.

Vice Adm. Daryl Caudle, commander of Naval Submarine Forces and Submarine Force Atlantic, said during his presentation that SSN(X) could be based on the Virginia design, could be based on the Columbia-class ballistic missile submarine (SSBN-826) design, or could be a clean-sheet design. “We’re going to get alternatives and make decisions on how to make this new SSN match what we need to stay ahead of our peers. This is definitely going to be increased speed: there’s no question that speed is basically important to improve every single joint warfare function. Speed is just so important – it plays out so well in all our wargaming, so it helps compensate for bad decisions, it also helps us get to the fight faster and helps us in all-domain maneuver warfare,” he said.

“We can never get enough payload capacity, so we do want submarines with large payload capacity. And what’s that going to look like in the future and how’s it going to be modular and customizable is going to be important. Of course, stealth is important, but not just acoustic stealth. It’s stealth across all spectrums. When this new SSN rolls out, we are going to have peer competitors that are going to be able to detect us not just acoustically but through algorithms that are going to break the water interface. And so those capabilities, we think, are coming, and we have to build and basically remain clandestine with those types of capabilities in play.”

Rendering of Block V Virginia-class submarine with Virginia Payload Module.
General Dynamics Electric Boat Image



Adm. Frank Caldwell, the director of the Naval Nuclear Propulsion Program and a senior submarine officer in the Navy, echoed in his remarks the three design options and said that “key in all of this will be our focus on speed, warfighting capability, greater energy, lethality and sensors, and, yes, the next level of stealth. I want you to know that we are working on this very actively as an enterprise.”

USNI News previously reported that the Navy may be leaning towards a Columbia-like hull for its next attack submarine. With the much wider diameter comes the ability to achieve greater speed and stealth. An SSN(X) design like this would be reminiscent of the Seawolf design – which was used for just three submarines as the Cold War was winding down but is considered the Navy’s most capable attack sub.

In a separate presentation during the event, Congressional Research Service naval affairs specialist Ron O’Rourke said, “I remember one person in public describing the Seawolf class as a boat that was designed to go up into the Soviets’ backyard and do a lot of damage before it had to come home to be rearmed – and so it was designed to be a fairly fast submarine and heavily armed, especially compared to the Los Angeles-class design of the day. So in light of the Navy now talking about this next-generation attack boat being fast and heavily armed, it would not be surprising, as some people have speculated, if that submarine were to have a diameter similar to that of the Seawolf or the Columbia-class design, something in the range of 40 to 43 feet.”

If that were to be the case, he said, SSN(X) might have a similar diameter to Seawolf but a greater displacement, due to modernization in engineering such as the SSN(X) likely having a larger electric drive system instead of a mechanical one.

Note: This article is from Popular Science and not validated. But seemed interesting. DM

TECHNOLOGY POPULAR SCIENCE

This New 1.2-ton Torpedo Can Hit a Target 31 Miles Away

It can cruise as deep at 1,640 feet beneath the surface, or as shallow as 50.

By *Christina Mackenzie* March 20, 2020



The F21 tor-
Naval Group

pedo.France's

The heavyweight torpedoes launched by submarines are secret, unseen, mysterious. Their universe: the dark silence of deep oceans. Their purpose: to destroy enemy subs and surface warships. Their use: only once every 80 years or so.

The weapon is more likely to sit in its launching tube for 30 or 35 years—that's the average life-span of a heavyweight torpedo—and then be dismantled, than it is to be shot at an enemy. That makes the delivery of a brand new, designed-from-scratch, heavyweight torpedo notable. And in this case, its makers boast that it is “the most advanced torpedo on the market.”

The F21, designed and manufactured by France's Naval Group, has been years in the making. The Naval Group finally delivered the first six of 93 to the French Navy in late November 2019. An unspecified number were then delivered in early January 2020 to the Brazilian Navy, which is replacing its Mark 48 torpedoes with the F21.

Torpedoes, which are basically underwater missiles, are classified as either heavyweight or lightweight. Heavyweights, delivered generally by [submarines](#)—but sometimes by surface warships—are designed to sink or cripple enemy submarines and [warships](#). They carry an explosive charge of about 660 pounds and travel at high speed towards the target either by themselves or guided by a wire that trails behind and attaches it to the submarine. Lightweight torpedoes, deployed by aircraft close to their target, cannot be wire-guided, carry only about 90 pounds of explosives, and are just used against submarines.

Examples of torpedo use are few and far between. The British submarine *Conqueror* torpedoed the Argentine warship *General Belgrano* on May 2, 1982, during the Falklands War; it sank, killing 323 of the 1,095 people aboard. They used the Mark VIII torpedo, which has been in service since 1927! And on March 26, 2010, the South Korean Navy's ROKS *Cheonan* was hit by a torpedo that some investigations concluded was fired by a North Korean midget submarine. Forty-six of the 104 people aboard were killed.

“A torpedo is not as beautiful as a submarine,” remarks Alain Guillou, senior executive vice president in charge of development at Naval Group. “But the level of complexity to develop these weapons is extremely high, which explains, even if it does not excuse, the difficulties we have encountered in recent years to finalize its development.” The F21 was originally scheduled to be operational in 2016, eight years after development work on it began.

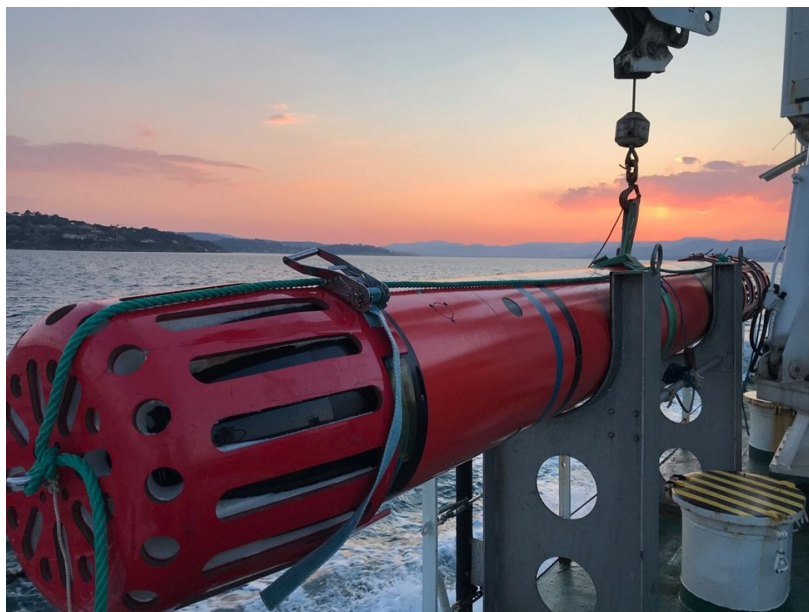
Three things make this torpedo special: its safety, range, and intelligence.

When it comes to safety, the battery “really makes the difference,” Patrice Pyra, sales director at the Naval Group’s underwater systems business unit, or BU ASM, tells *Popular Science*. The first requirement is that the torpedo does not accidentally explode, as happened aboard the Russian submarine *Kursk* on August 12, 2000, killing all 118 aboard. So one of the design requirements was that the F21 be extremely safe—with zero risk of an accidental launch or explosion.

Saft, which designs and manufactures advanced technology batteries for industry, specifically developed a silver oxide-aluminum electric battery that can only be activated by sea-water (which should be absent in the submarine, of course) so the torpedo is totally inert while inside. At the same time this battery provides twice as much energy and power as a conventional silver zinc battery, and is still the same mass and volume as its predecessor, so that the torpedo can fit into legacy launch tubes on the French Navy’s nuclear-powered Rubis-, Barracuda- and Le Terrible-class submarines.

The US, UK, Sweden and Russia use thermal batteries as the energy source for their torpedoes. These batteries “have an advantage in terms of power,” according to Jean-Martin Hepp, BU ASM marketing manager—but need an internal heat source to work and generate heat during operation, making their use “much more risky.” The torpedo becomes more detectable to an enemy using infrared sensors. They are also noisier. “The difference in noise is like the one between a petrol-powered car engine and an electric car engine,” explains Hepp.

A piston pushes the nearly 20-foot-long, 21-inch-diameter, 1.2-ton torpedo out of its launcher tube. An auxiliary battery takes the torpedo beyond a security zone around the submarine. A valve in the torpedo then opens, allowing seawater to reach the main battery and activate it. This provides power to the two propellers, which project the torpedo through the water at a speed of 50 knots to reach a target that can be up to 31 miles away.



The F21 travels double the distance any other torpedo can travel, in depths ranging from 50 to 1,640 feet. It can be discreetly guided all the way from the submarine via a fiber-optic wire (allowing for communication between the weapon and sub), many miles of which are unwound from inside the torpedo while the rest is unwound from the submarine. But the torpedo can also use its in-built acoustic homing device to detect and pursue its target by itself. In this mode and in shallow waters other sounds can confuse the torpedo—so the noises are treated digitally with the same type of processing as is used in modern sonars. “We did a lot of work on this acoustic part,” Hepp explains.

Once it has reached its target, the torpedo uses an all-electric fuse based on “slapper” detonation technology, also used by some missiles. The way it works is that a very high-speed solid flyer disc interacts with a high-density pellet of pressed explosive and the slap from this flyer disc detonates the explosive pellet. Naval Group considered this system to be more stable and safer than the conventional electro-mechanical detonation systems, found in most torpedoes.

The warhead contains an explosive known as PBX B2211. The “PBX” part means that the explosive is bound using 5-10 percent of a synthetic rubber so that it absorbs shock and is very unlikely to detonate accidentally, a crucial part of keeping it safe.

As for intelligence: the F21 carries a sonar, which are its eyes and ears. The data gathered is then processed by the tracking management system. “This is where we find the really disruptive technology,” Hepp says. When wire-guided, it allows an operator to see and hear what the F21 is seeing and hearing. But it also allows the F21 to analyze the tactical situation by itself. It can distinguish between a decoy and a real vessel, it can recognize a civilian or friendly ship among a fleet of enemies, and it can avoid all known counter-measures. “When your weapon is operating 30 miles away you have to have confidence in its capabilities,” Hepp remarks.

In comparison, the [US Navy](#) is still using the Mark 48 heavyweight torpedo designed in the late 1960s. It’s been in service since 1972. A new version, the Mark 48 Mod 4 or ADCAP, was last delivered in 1996—almost a quarter of a century ago. “Since then, the Navy has provided discrete improvements to the torpedo’s guidance and control and propulsion systems,” according to the US Navy’s Fact File.

Forbes

China And Russia In Mysterious New Submarine Project

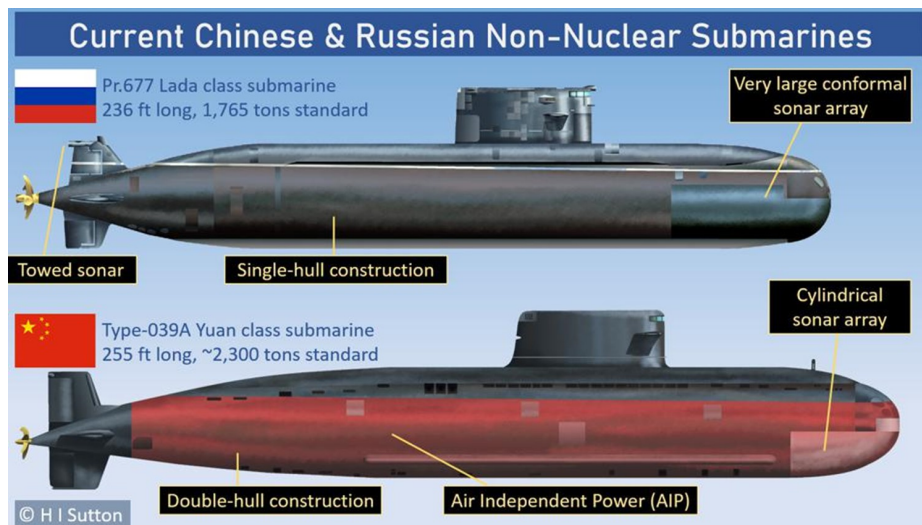
H I Sutton Former Contributor Aug 27, 2020,

[Aerospace & Defense](#)

I cover the changing world of underwater warfare.

Unlike the U.S. Navy, both Russia and China continue to operate non-nuclear attack submarines in addition to nuclear ones. They are cheaper and have some advantages compared to nuclear boats, especially inshore. And they can be exported to other countries. Now Russia and China may pool their knowledge to develop a new generation of non-nuclear subs. But exactly what it will be, or why, is still a mystery.

According to RIA Novosti, a state-controlled Russian news agency, Russia and China are collaborating on a new submarine design (in Russian). The project is being coordinated by Russia's Federal Service for Military-Technical Cooperation.



The Russian Lada Class submarine is noteworthy for its comparatively large and modern sonar system. ... [+] H I SUTTON

According to RIA Novosti, a state-controlled Russian news agency, Russia and China are collaborating on a new submarine design. The project is being coordinated by Russia's Federal Service for Military-Technical Cooperation.

Russia has a proud tradition of submarine building, creating many of the most powerful and largest subs in the world, so it's not surprising that Russian submarine technology is seen as significantly ahead of China's. Russia helped China develop its submarine building industry, giving it the plans to the Golf Class ballistic missile submarine and Romeo Class attack submarine during the Cold War. More recently Russia supplied China with Kilo Class diesel-electric attack submarines.

But China has gone its own way with submarine design and has the indigenous capability to build any category of sub. And while there are still categories of submarine where Russia is clearly ahead, in the field of non-nuclear submarines it is less clear cut. Certainly China's capabilities in this space should not be underestimated.

One important area where China may be ahead is in propulsion. China is building AIP (Air Independent Power) submarines while Russia has struggled to field this technology, though it was a pioneer of AIP in the early stages of the Cold War. Russia's current Lada Class boat was expected to have AIP but it has yet to be fitted. Given Russia's prowess in submarine design and construction the issue may be more about investment than engineering. But today it is fair to say that China is ahead in AIP.

Advanced batteries might be another space. Submarines are only now switching to lithium-ion batteries. The world's first Li-ion subs were Japanese, with South Korean and Italian subs to follow. China has also been rumored to be adopting this technology, making it another area where China might well be ahead of Russia.

So have the roles reversed, and might Russia in effect be looking to buy a largely Chinese non-nuclear submarine?

Combining the hull technology of one nation with the combat systems and weapons of the other is another possibility. For example, giving a Chinese submarine Russian sonar and weapons, or fitting a Russian submarine with Chinese battery and AIP technology.

Meanwhile the famous Russian submarine design bureau Malachite is promoting its own submarine design. The P-750B 'Serval' is 214 ft long and features a type of AIP which uses gas turbines fed by stored liquid oxygen. The design has been prominent at recent Russian arms expos, including the Army-2020 exhibition currently underway in Moscow. Chinese ship builders also promote their own designs. It is not clear therefore exactly where this new joint submarine fits into either navy's future line up.

Possibly the new submarine is not intended for the domestic navies of either country. Both compete on the international market, mainly with conventional attack submarines. China is getting an ever bigger share of this market with sales to Thailand, Bangladesh and Pakistan. A combined submarine may be a commercial consideration.

In the meantime Russia continues to order more of its existing non-nuclear submarine designs. An order has just been signed for construction of another Lada Class submarine as well as another of the older Improved-Kilo class boats.

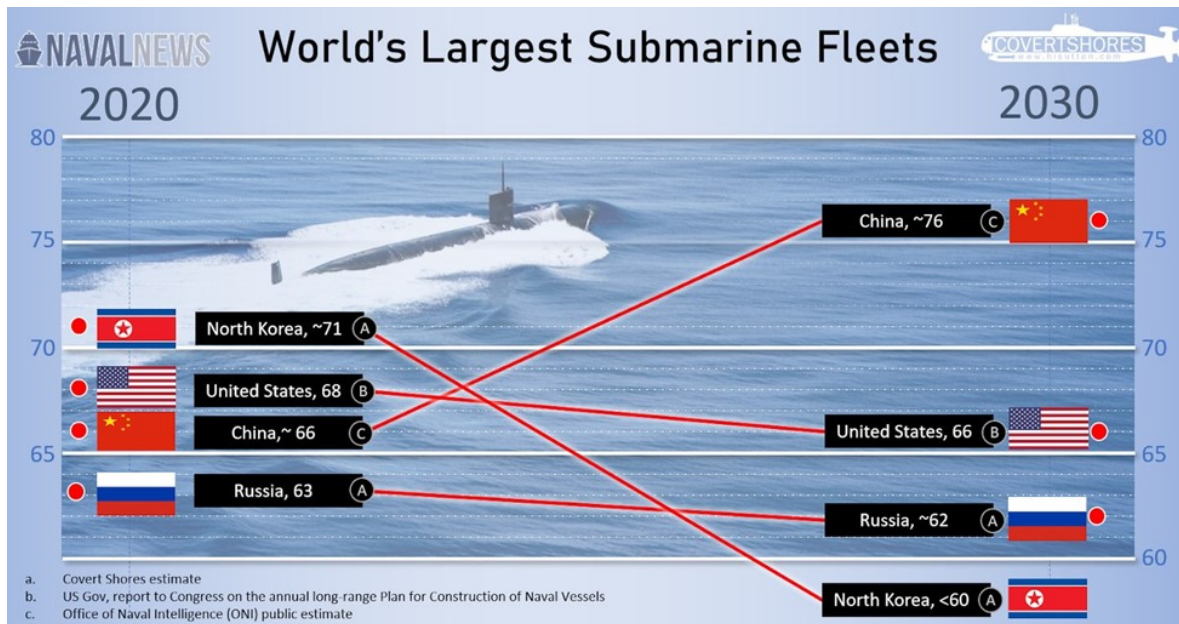
So the prospect of a joint non-nuclear submarine currently raises more questions than answers. And like many defense projects reported in the Russian state media it may not come to anything in the end. Like submarine warfare itself, finding information on new submarines is often a waiting game.



U.S. Navy Submarine Fleet To Be Overtaken By China Before 2030

H I SUT-
DEC 2020

TON 13



The U.S. Navy has a larger submarine force than China. 68 submarines compared to an estimated 66. This makes the U.S. Navy the second largest submarine force in the world, after North Korea. Our estimate for North Korea is 71 subs, although they are barely comparable to the other countries on the list. So China is currently third, and Russia fourth with 64. These are the four big players in terms of fleet size. Exact numbers are open to interpretation, but this order is generally agreed.

The next ten years could see a major shift in the rankings however. Based on current plans and projections, the U.S. and China will trade places by 2030.

By then the Chinese Navy, known as the PLAN (People's liberation army Navy) may have around 10 more submarines than America. This will make the PLAN the largest submarine force in the world, surpassing even North Korea (who anyway are projected to fall).

A report to Congress on the annual long-range **Plan for Construction of Naval Vessels** lays out the U.S. Navy's submarine force over the next 30 years. The plan is to build more submarines, increasing the rate to three a year for the Virginia Class. This will grow the force from 70 in 2022 to 92 in 2051. However, there will be a dip in numbers before it rises again as older boats will be decommissioned quicker than new ones can be built. The low-point will be between 2025 and 2030. This is also when China's investment in new construction facilities is expected to pay off.

Los Angeles Class submarine USS Chicago (SSN-721) during Exercise Valiant Shield 2020. She is expected to be decommissioned in 2024, along with several other Los Angeles class boats. US Navy photograph.



One category of boat which the U.S. Navy will lose completely before 2030 is the cruise missile submarine (SSGN). The four Ohio Class SSGN conversions will be decommissioned in 2026/7. The Ohios' are the heaviest conventionally-armed submarines afloat. They will be partially replaced by the Virginia Class Block-V boats which will carry more cruise missiles than current versions.

Estimates of the PLAN's submarine force vary. The figure of 76 in 2030 comes from a March 18 2020 US government report on China Naval Modernization. Given China's significant investment in infrastructure this growth is easily accepted. China has expanded the Bohai shipyard where its nuclear submarines are built. New classes of both attack submarines and ballistic missile submarines are expected to emerge soon. In fact the first signs of new submarines have already been observed. Many of China's submarines are diesel-electric. These boats are smaller and shorter ranged than the U.S. Navy's all-nuclear fleet. But this may make them better suited to some operations, for example in the shallow waters off the Chinese coast. It also makes them cheaper and easier to produce. The latest models, the Type-039A Yuan class, have air-independent power (AIP).

China has recently moved a major non-nuclear submarine construction facility out of Wuhan. The new site is further down the river at the Shuangliu yard. This is larger and more discrete. It may allow an increased rate of submarine construction, although some of the boats will be for export to Pakistan and Thailand.

The U.S. Navy's decrease in submarines will be partly made up by a new category of underwater vehicle which the U.S. Navy. Extra-large Uncrewed Underwater Vehicles (XLUUVs) will perform some of the missions currently done by crewed submarines. The U.S. Navy is currently leading the charge with these and should receive the first four Orca XLUUVs by 2025. Their compact dimensions and relative expendability may make them particularly potent in littorals.

It is difficult to project whether the PLAN will follow the U.S. Navy's lead with XLUUVs. It seems entirely possible, and they have developed large displacement UUVs (one category smaller). There is insufficient open source intelligence on a Chinese XLUUV program however.

The combat potential of a submarine fleet is not based on numbers alone. The quality of the boats, their weapons and their crews all come into play. And the U.S. Navy is widely seen as far ahead of the PLAN today. But quantity has a quality all of its own. And the U.S. force is much more spread out than china's, also facing an increasingly assertive Russian Navy submarine fleet. And no submarine, however dated, can be written off as not a threat.

WWA Web Page

Stan Cook has been upgrading our web page on a continuous basis. If you haven't been on the web page lately, Check it out; www.usswoodrowwilson.com

Bill Richards has finally gotten the 817 Charleston Reunion photos sorted and selected to fit on the DVD. The DVD is broken down by photos for the various Reunion events. It ended up with about 500 photos. The intent was to make sure there are photos of all the Reunion attendees.

He will now fill the prepaid DVD orders. If any shipmate would like to purchase a DVD, the cost is \$10. Please send monies and shipping info to Bill at: Bill Richards, 181 Emerald Acres Dr, Selah, WA 98942-9558. I've also placed about 200 (reduced size) of selected photos on the WWA Web Page.

Kudos to Bill. This effort has been a real chore for him and taken many hours. Thanks Bill.

Kudos to shipmate Bob Browning for all his efforts in taking all of these great Reunion photos.

Thank You Bob.

Ships Store Info

With the cancellation of the DC Reunion we have a limited supply of Ships Store items on hand. While preparing for the DC Reunion, we had staged a lot of our inventory with Jerry Starr in South Carolina. This has been our procedures for most of the Reunions. We're presently trying to figure out how we want to get these logistics straightened out.

For the time being, if you wish to order something via the WWA Web Page, please contact me in advance, so I can make sure the item is available. We presently have a limited amount of items staged with Bill Richards (he does most of our packing and shipping of orders).

NOTE: Don't forget that Unlimited Details gives discount "Kick back" to the WWA for every purchase you make from their Web Store. They have setup a WWA web page on their system:

<http://www.unlimiteddetails.com/store-624.html>. We've put up some items on this page, but if you go to the WWA page first then decide you want to link to the Main Web page for more selections, just click on the Main page link. That way they will know you are a Shipmate and the discount to WWA will also apply.

Please contact me with your questions at 360-271-9830 or email: mcross@telebyte.com.

Thanks,

Mel



Part of a Burial at Sea ceremony aboard the USS Newport News

Shipmates on Eternal Patrol

Sorry to say that we have been informed of the loss of more shipmates: (many of the Death notifications that we receive are way after the event): *Our condolences go out to the family and friends.*

Glen Andrews, FTBC/SS, Gold Comm, 1963-66 (COB)

Larry Brew, MT3/SS, Gold Crew, 1964-65

Clyde (Russ) Johnston, MM2/SS, Gold Crew, 1966-69 (WWA Pres)

Larry Pinder, ETN3/SS, Gold Crew, 1968-69

Patrick Shields, MM1/SS, Gold Crew, 1970-76

Melvin Slack, CSCS/SS, Blue Comm, 1963-65

“Sailor Rest Your Oar”

Woodrow Wilson SSBN/SSN-624 Association



Woodrow Wilson SSBN/SSN624 Association
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WWA Officers: 2020-2022

President: Wayne Grey
Vice President: Richard Stepp
Secretary: Dennis Morgan
Treasurer: Mel Cross