NAVY NEWS WEEK 9-5

3 March 2022

Russian Convoy Will Test Turkey And NATO

By Tuvan Gumrukcu and Jonathan Spicer (Reuters) –
February 28, 2022

Russian Navy's diesel-electric submarine ***Rostov-on-Don*** sails in Bosphorus, on its way to the Black Sea, in Istanbul, Turkey February 13, 2022. REUTERS/Yoruk Isik

Turkey's pledge to block some Russian warships from passing through its waters to the Black Sea during the Ukraine crisis could help repair its ties with NATO, even as it risks reprisals from Moscow. But a build-up of Russian ships waiting to make the journey will test Ankara's resolve over the next few days and show how far it is willing to go in tilting its uniquely delicate diplomatic balance between east and west. Turkey changed its rhetoric to call Moscow's assault on Ukraine a "*war*" on Sunday – a move that would allow Ankara to use parts of an international pact to limit the transit of some Russian warships from the Mediterranean to the Black Sea. That could curb Moscow's ability to build up its naval force attacking Ukraine's Black Sea Coast, though it all depends on the small print in the 1936 Montreux Convention. The pact allows Turkey to limit naval transit of its Dardanelles and Bosphorus straits during wartime but has a clause exempting ships returning to their registered base. At least four Russian ships are currently waiting on Turkey's decision to cross from the Mediterranean, Yoruk Isik, an Istanbul-based geopolitical analyst and head of the Bosphorus Observer consultancy, said. Two of them – a frigate and a destroyer – have formally asked to make the journey as soon as this week, according to Isik and a senior Turkish official. Any of them claiming the Black Sea as their base could still make the journey, leaving Turkey with some wriggle room. "*Calling it a 'war' is a very big step*," Isik told Reuters. "*Ankara didn't want to take this step and, with the language, is giving Moscow one last chance to stem aggression in Ukrainian cities*."

High stakes

The stakes are high for NATO member Turkey which has maritime borders and good ties with both Russia and Ukraine. A decided shift to the West could burnish its standing within NATO after Turkey's 2019 purchase of Russian S-400 missiles soured relations and triggered U.S. sanctions. Yet, any step too far may harm Turkey's already beleaguered economy after a currency crisis in December and an inflationary spiral. Russian natural gas accounts for 45% of Turkish imports, while Russians account for 20% of Turkey's tourists. Atilla Yesilada of GlobalSource Partners said Turkey's shift over the conflict was "*almost certain to draw the Russian wrath*," and that this would be seen with bans on Turkish agricultural exports or provocations in Syria. A separate official with knowledge of the matter said Turkey's government planned to take steps to boost the economy now that fallout from the conflict is being felt "*more and more by the day*." The lira briefly tumbled 5% last week as the attacks – which Russia call a "*special operation*" – began. Meanwhile, Turkey's politicians have kept their own rhetoric measured. President Tayyip Erdogan has criticized the Western approach to Moscow including the use of sanctions, while also taking a sharp tone towards Russia, calling the invasion "*unacceptable*" and a "*heavy blow*" to regional security. While forging close ties with Russia on energy and defense, Ankara has sold drones to Ukraine and inked a deal to co-produce more, angering Moscow. Foreign Minister Mevlut Cavusoglu appealed to Russian and Ukrainian counterparts for a ceasefire and negotiations, which Erdogan has offered to host. Cavusoglu said on Sunday that ships returning to base in the Black Sea will be

permitted passage and evaluated on a case-by-case basis. When it came to establishing the ships' all-important home station, he added: "*Everything should be transparent*."

Source: https://gcaptain.com

Biden Sends Navy Admiral To Taiwan

By Michael Martina and David Brunnstrom (Reuters) –
February 28, 2022

A navy soldier adjusts a Taiwan flag on board **ROCS *Chang Chien* (PFG2-1109)** ahead of the National day celebration in Kaohsiung, Taiwan, October 9, 2021. REUTERS/Ann Wang

U.S. President Joe Biden will send a delegation of former senior defense and security officials to Taiwan on Monday, a senior official of his administration said, a sign of support for the island claimed by China after Russia's invasion of Ukraine. The visit led by Admiral Mike Mullen (USN retired), the one-time chairman of the Joint Chiefs of Staff, comes at a time when Taiwan has stepped up its alert level, wary of China taking advantage of a distracted West to move against it. Beijing claims the democratically governed island as its own and has vowed to bring it under Chinese control, by force if necessary. Mullen, a retired Navy admiral who served as the top U.S. military officer under former presidents George W. Bush and Barack Obama, will be accompanied by Meghan O'Sullivan, a former deputy national security advisor under Bush, and Michele Flournoy, a former undersecretary of defense under Obama, according to the official, who spoke on the condition of anonymity. Two former National Security Council senior directors for Asia, Mike Green and Evan Medeiros, will also make the trip, which is intended to "*demonstrate our continued robust support for Taiwan*," the official told Reuters. The delegation is expected to arrive in Taiwan on Tuesday afternoon and stay until Wednesday evening, during which time they plan to meet Taiwan's President Tsai Ing-wen, Defense Minister Chiu Kuo-cheng and other senior officials. Taiwan's presidential office confirmed the visit and meeting with Tsai, saying that its timing during the Ukraine crisis showed Taiwan-U.S. ties were "*rock solid*." The U.S. official declined to say whether the timing of the visit was influenced by Russia's invasion of Ukraine. Taiwan said last week that former U.S. Secretary of State Mike Pompeo, who served under former President Donald Trump, would visit from March 2-5 and meet Tsai.
The Biden administration has declined to comment on Pompeo's visit, calling him a private citizen. Referring to the delegation led by Mullen, the senior administration official said: "*The selection of these five individuals sends an important signal about the bipartisan U.S. commitment to Taiwan and its democracy, and demonstrates that the Biden administration's broader commitment to Taiwan remains rock solid*." The official added that Washington would regard "*any effort to determine the future of Taiwan by other than peaceful means a threat to the peace and security of the Western Pacific*." "*The United States will maintain the capacity to resist any resort to force or other forms of coercion that would jeopardize the security or the social or economic system of the people of Taiwan*," the official said. Mullen's delegation marks the first public visit of a group of former officials to Taiwan at Biden's behest since April 2021, when former U.S. Senator Chris Dodd and former Deputy Secretaries of State Richard Armitage and James Steinberg travelled there and met with Tsai, who Beijing accuses of seeking independence. The latest trip comes days after a U.S. warship sailed through the sensitive Taiwan Strait, the waterway between China and Taiwan. The U.S. military described its passage as routine but Beijing said it was "*provocative*." The White House on Sunday called on China to condemn Russia's invasion of Ukraine. But Beijing has largely steered clear of criticizing Moscow after Russian President Vladimir Putin and China's leader Xi Jinping announced an enhanced strategic partnership aimed at countering U.S. influence just weeks before the invasion. Under long-standing U.S. policy, Washington has only unofficial relations with Taipei and recognizes Beijing diplomatically. However, U.S. law requires it to provide Taiwan with the means to defend itself and the Biden administration has

vowed to continue Trump's and Pompeo's policy of stepping up engagement with the island. Russia's attack on Ukraine has given added impetus to a growing debate about the longstanding and controversial U.S. policy of "*strategic ambiguity*," under which Washington refuses to say explicitly whether it will defend Taiwan militarily in the event of Chinese attack. Some U.S. lawmakers, including the Democratic chairman of the influential House Intelligence Committee Adam Schiff, have urged greater clarity about the U.S. "*obligation*" to defend Taiwan amid stepped up Chinese military pressure, but proponents of existing policy say this could worsen the risk of conflict. China's ambassador to Washington said in January the two super powers could end up in a military conflict if Washington encourages Taiwan's independence. **Source: https://gcaptain.com**

Ghana commissions Flex Fighter vessels; will be acquiring more OPVs

Written by Guy Martin -
1st Mar 2022

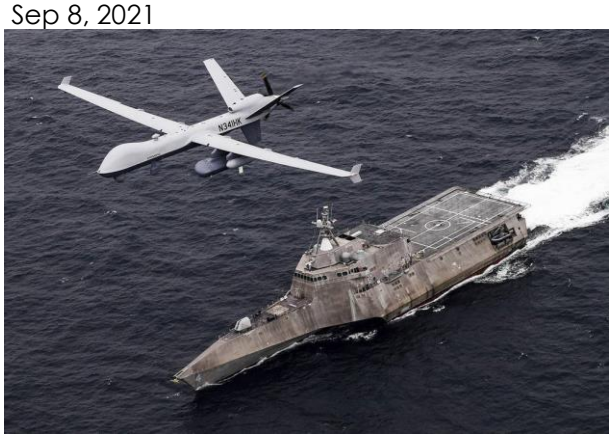
A Ghana Navy Flex Fighter vessel.

Ghana's President Nana Addo Dankwa Akufo-Addo has commissioned four new Flex Fighter vessels for the Ghana Navy and revealed that two new offshore patrol vessels (OPVs) will be acquired. The Flex Fighters were commissioned into service on 25 February at the Sekondi-Takoradi Naval Base in the Western Region, after being delivered in early January from Singapore's Penguin Shipyard. The four vessels are christened Ghana Navy Ship (**GNS**) ***Volta***, **GNS *Densu***, **GNS *Pra*** and **GNS *Ankobra***. "*In addition to these four ships being commissioned today, Government is in the process of acquiring two offshore patrol vessels with high endurance limits, to maintain a constant presence at sea*," Akufo-Addo is reported by the Presidency as saying. The government will also procure additional patrol vessels to respond to the myriad of threats along the coastline, he said, adding that "*financing for the acquisition of these ships has been already provided for in the security sector retooling programme initiated by the Akufo-Addo Government*". The acquisition of the Flex Fighter vessels, according to Akufo-Addo, "*is yet a further manifestation of the commitment of Government to retool and re-equip the Ghana Armed Forces to enable them perform their duty of protecting the territorial integrity of our nation*." "*These four ships are to provide dedicated security to our offshore oil and gas installations, which have, hitherto, been, regrettably, unprotected. They were acquired through a public-private partnership between the Ministry of Defence, Israel Shipyards, Ghana Commercial Bank and two international oil companies*," Akufo-Addo said. The President noted that the provision of effective maritime security was of utmost importance because Ghana's economy is highly dependent on offshore resources, which hold enormous potential for the country's food security and employment generation. The Flex Fighter vessels will be used to safeguard oil and gas activities in the Gulf of Guinea – according to the Daily Graphic, only Ghana Navy ships will be allowed to protect offshore oil and gas infrastructure in the country, displacing private security vessels, which have proliferated with the growth of piracy in the region. According to Penguin Shipyard, the Flex Fighter is based on the company's proven Flex 40 series of crew boats, but fitted with all-round wheelhouse ballistic protection (STANAG Level I), machinegun mounts with gunner shields forward and aft, and cabins and amenities for 12 security personnel. The 40 metre long aluminium-hulled Flex Fighter is powered by three Caterpillar C32 main engines each developing 1 450 hp, giving a top speed of 28 knots. Up to 54 passengers can be seated and there is a 93 square metre cargo deck. The Flex Fighter is aimed at offshore oil companies operating in high-threat environments and several are already operated by Nigerian security companies. Penguin Shipyard has delivered more than 60 Flex Fighters to customers around the world. Next year

Ghana will take delivery of two more vessels – these are SAFE Boats International Defenders, being acquired via the US Coast Guard. SAFE Boats International will supply two 38-foot (12 m) Defender class boats along with trailers, spare parts and training. They will be used to help Ghana fight piracy and other maritime crime. Ghana has previously received other Defender class boats from the United States: by 2015 the US Coast Guard had given Ghana's Navy five 27-foot Defender class boats to aid their operations. Currently, piracy and armed robbery in the Gulf of Guinea continue to pose significant threats to national and regional maritime activities, including the operations of the facilities of the offshore oil and gas sector. In response, Ghana has been strengthening its navy. Ghana has slowly built up its naval capabilities, introducing new vessels into service over the last decade. In October 2017 it commissioned into service four patrol boats donated by China. The four Chinese-made patrol boats (985Y) have a maximum displacement of 8.6 tons, a maximum speed of 38 knots and range of 220 nautical miles. Previously, Ghana has bought Chinese military hardware that includes two 46 metre patrol vessels ordered from Poly Technologies in 2008. The two were commissioned in 2011. The navy also operates several other fast attack craft and patrol boats that were ordered from South Korea, the United States and Germany over the past decade. New naval infrastructure is also being added, including multiple forward operating bases across the coastline. **Source: https://www.defenceweb.co.za**

US Navy launches Mideast drone task force amid Iran tensions

By Jon Gambrell, The Associated Press
Sep 8, 2021



An MQ-9 Sea Guardian unmanned maritime surveillance drone flies over the littoral combat ship ***Coronado*** during a drill in the Pacific Ocean April 21. (MC Shannon Renfroe/Navy via AP)

DUBAI, United Arab Emirates —
The U.S. Navy's Mideast-based 5th Fleet said Wednesday it will launch a new task force that incorporates airborne, sailing and underwater drones after years of maritime attacks linked to ongoing tensions with Iran. Navy officials declined to identify which systems they would introduce from their headquarters on the island nation of Bahrain in the Persian Gulf. However, they promised the coming months would see the drones stretch their capabilities across a region of chokepoints crucial to both global energy supplies and worldwide shipping. "*We want to put more systems out in the maritime domain above, on and below the sea*," said Vice Adm. Brad Cooper, who leads the 5th Fleet. "*We want more eyes on what's happening out there*." The 5th Fleet includes the crucial Strait of Hormuz, the narrow mouth of the Persian Gulf through which 20 percent of all oil passes. It also stretches to the northern end of the Red Sea, near the Suez Canal, the waterway in Egypt linking the Mideast to the Mediterranean, and the Bab el-Mandeb Strait off Yemen. The systems being used by the 5th Fleet's new Task Force 59 will include some of those involved in an April test led by the Navy's Pacific Fleet. Drones used in that exercise included ultra-endurance aerial surveillance drones, the unmanned surface vessels Sea Hawk and Sea Hunter, and smaller underwater drones that resemble torpedoes. The 5th Fleet includes shallow water areas, salty waters and temperatures in the summertime that can go above 113 degrees Fahrenheit with high humidity. That can prove rough for crewed vessels, let alone those running remotely. "*I think that environment really suits us well to experiment and move faster*," Cooper said. *And our belief is if the new systems can work here, they can probably work anywhere else and can scale them across other fleets*." It also represents a region that has seen a series of at-sea attacks in recent years. Off Yemen, bomb-laden drone boats and mines set adrift by Yemen's Houthi rebels have damaged vessels amid that country's years-long war. Near the United Arab Emirates and the Strait of Hormuz, oil tankers have been seized by Iranian forces.

Suspicious explosions also have struck vessels in the region, ranging from tankers owned by Western firms and ships tied to Israel to Iranian vessels. Those attacks have become part of a wider shadow war playing out across the region in the wake of then-President Donald Trump's 2018 decision to unilaterally withdraw from Iran's nuclear deal with world powers. Iran even shot down an American drone amid the tensions. While President Joe Biden has said he's willing to re-enter the deal, negotiations in Vienna have stalled as Iran now has a new hard-line president. That leaves open the possibility of further attacks by Iran — as well as by Israel, which has been suspected in incidents targeting Iranian shipping and its nuclear program. Cooper acknowledged the tensions in his remarks to journalists Wednesday, but declined to go into specifics. "*We're very aware of Iran's posture and we'll be prepared to deal with that appropriately*," the vice admiral said. "*I'm going to leave it at that*." Iran's mission to the United Nations did not immediately respond to a request for comment on the new Navy task force. However, it operates its own drone fleet and has published video in the past of flyovers of American aircraft carriers in the region. The U.S. military also has said fragments left by an attack in July off Oman that killed two people on an Israeli-linked ship corresponded to Iranian military drones. **Source: https://www.navytimes.com**

HNLMS *Friesland* being reversed moored alongside **HNLMS *Pelikaan*** by local tugs ***Manta*** and ***Lima II*** in Willemstad (Curacao), note both heavy fenders alongside **HNLMS *Pelikaan***
Photo : Ger Lepel (c)

Sailor facing court martial in Navy ship fire

By BRIAN MELLEY and JULIE WATSON

A sailor accused of starting the fire that destroyed the **USS *Bonhomme Richard*** will face a court martial for arson, the Navy said, Friday. Seaman Recruit Ryan Mays, 20, faces two counts in military court for the July 2020 blaze that injured dozens of personnel aboard the amphibious assault ship as the fire burned for five days and sent acrid smoke wafting over San Diego. It marked one of the worst noncombat warship disasters in recent memory and the vessel had to be scrapped. It would cost an estimated $4 billion to replace. Mays set the fire because he was disgruntled after dropping out of Navy SEAL training, prosecutors said. His defense lawyers said there was no physical evidence connecting him to the blaze. Mays was charged with aggravated arson and the willful hazarding of a vessel. Defense lawyer Gary Barthel said the decision to proceed to trial came despite a hearing officer's recommendation that there wasn't enough evidence to win a conviction after a preliminary hearing in December. "*In our perspective it's that the Navy's not looking for justice in this case*," Barthel said. "*What the Navy's looking for is to make Mays a scapegoat*." Mays is disheartened by the decision, Barthel said. He maintains his innocence and looks forward to proving it at trial. A Navy spokesperson did not return phone and email messages seeking comment. Over a three-day hearing in December, one witness placed Mays in the area where the fire broke out aboard the ship and another said he later made a seeming confession to igniting it. "*I'm guilty, I guess. I did it*," Mays mumbled as he was being led to the brig, in August 2020, Sailor Carissa Tubman testified. Mays then said: "*It had to be done*." Mays was stunned he was being locked up at the time and was being sarcastic, defense lawyers said. Mays is no longer being detained. He was demoted after the December hearing, though the Navy has declined to say why. The witness who placed Mays near the start of the fire offered conflicting statements about whether he was certain it was Mays. Another sailor credited Mays with saving him from the fire. The lead federal fire investigator for the government determined the fire was started, July 12, 2020, by someone who ignited cardboard boxes in a vehicle storage area below deck. The defense presented evidence from experts that the blaze may have been sparked by an electrical malfunction. Mays told

investigators he became aware of the fire while in the hangar bay and said he alerted one crew member and helped fight the blaze, according to court documents. About 160 sailors and officers were on board as strong winds whipped flames into an inferno that sparked explosions. More than 60 sailors and civilians were treated for minor injuries, heat exhaustion and smoke inhalation. **Source : AV Press**

MPs examine the future of military shipbuilding in Scotland

In the second phase of its Defence in Scotland work, the Scottish Affairs Committee launches a new inquiry examining military shipbuilding in Scotland. Shipbuilding in Scotland currently supports 7,000 jobs in Scotland, many of which are highly skilled. Maintaining this employment, and a flourishing sector, relies on a regular drumbeat of orders. However, in last year's Defence and Security Industrial Strategy, the UK Government revised its shipbuilding strategy to allow the possibility of more open international competition, rather than all Royal Navy warships being designed and built solely in the UK. Unions have expressed concern that this position undermines the confidence that the industry requires in order to invest. The Committee will be exploring the impacts such policy changes are having on the industry in Scotland. It will also consider the opportunities for Scotland of exporting design licences for ships, and what more the UK Government could be doing to support the sector. Scottish Affairs Committee Chairman, Pete Wishart, said: "*In the next phase of our Defence in Scotland inquiry series, we will be considering military shipbuilding and the much-anticipated National Shipbuilding Strategy refresh. The shipbuilding industry in Scotland supports many highly skilled jobs, but its future success could be undermined by UK defence policy. During this inquiry, we will look at what challenges changes in defence policy present for the sector, and the potential opportunities which can be opened up for Scottish industry through exports*." This inquiry will build on the recent Defence Committee report, "*We're going to need a bigger Navy*", and the Government response, which has been published today. In it the Government responds to the Committee's recommendations to expand and upgrade the UK's fleet and support our shipbuilding industry. The Committee is inviting written submissions by Tuesday 10 May. These should focus on, but not be limited to:

- What impacts are the Government's Shipbuilding Strategy and National Shipbuilding Office having on the shipbuilding industry in Scotland?
- How many and what types of Royal Navy ships will likely be built in Scotland in the years ahead? Will the sector grow?
- How does the procurement approach for each class of Royal Navy ship being determined on a case-by-case basis (including whether or not there should be international competition) affect Scottish shipbuilding
- To what extent does Scotland benefit from exporting military ships (or parts of them) and/or their design licences? How can these opportunities be maximised?
- What more could the UK Government do to maintain and foster military shipbuilding in Scotland? **Source: Maasmond Maritime Clippings**

USCG's First Polar Security Cutter to be Named *Polar Sentinel*

By : Eric Haun

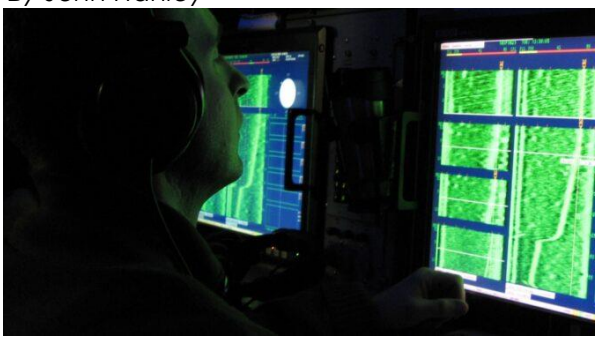
The first ship in the U.S. Coast Guard's Polar Security Cutter program will be named ***Polar Sentinel***, Commandant Admiral Karl Schultz revealed in his 2022 State of the Coast Guard Address, delivered Thursday in Clearwater, Fla. The Polar Security Cutter program is planned to replace the Coast Guard's aging fleet of icebreakers, including the 46-year old heavy icebreaker **USCGC *Polar Star*** and 23-year-old medium icebreaker **USCGC *Healy*.** Pascagoula, Miss. shipbuilder Halter Marine has been awarded contracts to build the first two Polar Security Cutters, and the U.S. Coast Guard has an option for a third vessel. If all options are exercised, the total contract value is $1.9 billion. "*Detail work remains underway in preparation for construction of our first Polar Security Cutter*," Admiral Schultz said in his address. According to the Coast Guard website, construction on the first PSC is expected to begin sometime this year. Admiral Schultz called the Polar Security Cutter "*a state-of-the-art ship, requiring exacting designs, complex steel work and systems integration*," He added, "*When our fleet of Polar Security Cutters becomes operational, the work of these uniquely*

capable assets will be essential to protecting our economic, our environmental and our national security interests in the polar, or what we call the high latitude, regions." Halter Marine has partnered with Technology Associates, Inc., (TAI) to design the new ships. Each 460-foot-long icebreaker will have a 88-foot beam and full load displacement of approximately 22,000 long tons. A 45,200-horsepower diesel electric propulsion system will help make the vessels capable of breaking ice between six and eight feet thick. Polar Security Cutters will each accommodate 186 personnel comfortably for an extended endurance of 90 days. The shipbuilder has also teamed with ABB for its Azipod propulsion and Trident Marine for its power distribution system, Raytheon for command and control systems integration, Caterpillar for the main engines, Jamestown Metal Marine for joiner package, and Bronswerk Marine for the HVAC system. **Source : MarineLink**

Back to the Future: Routine Experimentation with Prototypes

July 26, 2021

By John Hanley



Navy Petty Officer 2nd Class Shawn Halliwell monitors a waterfall display on his sonar system during a battle drill aboard the strategic missile submarine USS Maryland, Feb. 16, 2009. (DoD Photo).

Broad agreement exists that the Department of Defense's, and thus the Navy's, acquisition system is bound like Gulliver by Lilliputian processes, resulting in an inability to adapt. This inflexibility threatens to increase the risks to operating forces as they face a growing number of adaptive adversaries, ranging from China and Russia, North Korea and Iran, to the Islamic State, Al Qaeda, and others.[1] Well-intended legislation and increasing reliance upon computer modeling to inform the selection of future platforms and systems are major contributors to the current situation. Greater reliance on experimenting with prototypes at sea could provide a large improvement.[2]

Introduction

Congress passed the Goldwater-Nichols legislation in 1986 to promote joint operations and provide more civilian control by creating an Undersecretary of Defense for Acquisition and reducing the role of the Chief of Naval Operations (CNO) and other Service Chiefs in acquisition decisions. This legislation added joint duty requirements to the already-packed career paths for line officers, even as it added new educational and experience requirements for acquisition professionals.[3] The Defense Acquisition Workforce Improvement Act in 1990 further created mandatory requirements for a more professional acquisition force. Line and acquisition professionals "*had completely different chains of command and, consequently, were situated in different performance evaluation and promotion structures*."[4] Having little appreciation for an increasingly complex acquisition process, line officers had trouble articulating their needs to an acquisition workforce that was itself increasingly isolated from the operational environment. Though the Packard Commission that informed Goldwater-Nichols legislation called for more prototyping to gain experience with new platforms and systems before making major investments, the Department of Defense (DoD) and the Navy increasingly turned to computer-based combat and campaign simulations as a cheaper and more flexible way to inform acquisition decisions.[5] This had the effects of further separating the experience of fleet operators from Navy acquisition, and removed an important source of data for ensuring computer-based simulations were accurate.[6] In their book ***Switch: How to Change Things When Change Is Hard***, Chip and Dan Heath highlight the value of bright spots; examples of projects that work well to make a case for needed change.[7] This article suggests some bright spots, and continuing challenges, in acquiring capabilities the Navy needs to adapt to rapidly emerging security opportunities and challenges.

A Virtuous Prototype Cycle

As a junior officer, I was privileged to be assigned to the **USS *Guitarro* (SSN 665)** in San Diego in 1973. The ***Guitarro*** played a major role in developing tactics for prototype combat systems deployed to the Pacific submarine fleet, in particular the new Submarine Towed Array Sensor System (STASS) along with its BQR-20 series digital sonar displays. In the mid-1970s, ***Guitarro*** also installed the first digital submarine combat system (BQQ-5 sonar and Mk-117 fire control system) and participated in the development of submarine-launched Harpoon and Tomahawk cruise missiles.[8] Following my service on the ***Guitarro***, I became an operations analyst supporting several programs. The Naval Electronics Systems Command (PME-108) was sponsoring the Coordination in Direct Support (CIDS) program developing technology and techniques for communicating with submarines to operate in direct support of carrier battle groups, and the Over-the-Horizon Targeting (OTH-T) program was developing technology and techniques for targeting ships with Harpoon and Tomahawk missiles at ranges beyond the line of sight. These programs integrated their efforts with the Tactical Development and Evaluation Program sponsored by the OP-953 on the Navy staff. My next job involved working with the Chief of Naval Operations Strategic Studies Group where I witnessed the speed with which a small team of intelligence specialists, engineers using the latest technology, and Navy leadership could deliver cutting edge capabilities to the fleet very rapidly. My experience in these programs taught the value of providing prototypes to the fleet early. Working with prototypes allowed us to develop tactics and techniques that the system developers never considered, and highlighted operational limitations and misperceptions of those developing the systems. Fleet analysis data contributed directly into operations analysis, computer simulations, and war games. The experience also demonstrated the limitations of tightly-coupled integrated systems as opposed to systems with modules that could adapt and change easily. As my career continued, I observed revisions to the DoD acquisition system that diminished the role of prototyping and extended times to demonstrate new capabilities to the fleet, usually exceeding cost estimates and requiring modifications as operators discovered what they could, and could not do.

Sonar Towed Arrays and Digital Displays

STASS was a long, linear array of hydrophones deployed behind the submarine on a cable. This kept the array's sensors away from the towing submarine's radiated noise, significantly improving the signal-to-noise ratio needed to detect faint signals. It could detect contacts behind the submarine that were screened from the hull-mounted sensors in the bow. Its length provided a larger aperture to detect lower frequencies at longer ranges. This sonar system made submarines more effective. However, the new system had its challenges. Initially, a sonar operator could monitor only one of the array's 16 beams at a time, by listening and/or monitoring the BQR-20's digital display.[9] The display would provide a waterfall of illumination if a signal was detected on that beam. Low frequencies required several minutes of integration time to process signals from the ambient noise. Thus it could take more than an hour to search though all of the beams. The submarine also had to travel at slow speed to prevent the noise from water flowing over the hydrophones from masking signals from other vessels. Even with the slower speeds, the longer detection ranges provided the new sonar system significantly increased the search rate in deep ocean areas. The principal tactic for estimating a targets range using passive sonar was developed by Lieutenant John Ekelund in 1956.[10] Ekelund's approach significantly improved upon target motion analysis techniques that involved only plotting bearings to a target over time. His method involved calculating the rate of change of the relative bearing of the contact as the host submarine maneuvered on two courses. The time to do the calculation affected the accuracy of the estimate. Slow maneuvering with the STASS was frustrating. Our sister ship, **USS *Drum* (SSN 677)**, was the first ship in the Pacific fleet to receive the new STASS. To reduce the time maneuver to a new course, Drum tried a tactic of speeding up through the turn, then slowing to reduce the flow noise. Unfortunately, the sub slowed faster than the array, resulting in the array's cable wrapping around the horizontal stabilizer on the sub. ***Guitarro*** then had its opportunity to develop tactics for employing the STASS. Our efforts focused on three areas: maneuvering the ship, sonar search procedures, and plotting contacts. I had the lead on plotting. Current practice used a "*compressed*" time-bearing plot along with "*strip*" plots. The time bearing plot provided bearing rates needed to compute Ekelund

ranges. Speed strips marked with various speeds were manually aligned across bearings to a contact's for estimating its range, course, and speed. Given the time required to generate contact bearings with the STASS, we developed an "*expanded*" time-bearing plot. A big innovation occurred when Dr. Ted Molligen (a ship rider from Analysis and Technology, Inc.) noted that the array's beams were cones and the sea bottom was a plane. The intersection of a cone and a plane is a hyperbola. Therefore, when the contact's signal bounced off the bottom, which occurred frequently in the Pacific, we were dealing with lines of bearing along a hyperbola. Within a day, we manufactured templates of hyperbolas out of Plexiglas for strip plotting using bottom bounce signals. Without measuring bearing rates, the intersection of two hyperbolas provided a contact's estimated position quickly after our maneuver. Another unanticipated effect was the ability to observe the contact's Doppler signal shift in near-real time. Thus we could observe not only the contact's bearing change during maneuvers, but also whether it was opening or closing us. Reconstructed plots of our target clearing its baffles (simulating "*crazy Ivans*") during exercises showed our depiction of the target's motion to be very accurate. The next breakthrough occurred when we received the BQR-22 a couple of months later. The BQR-22 could process two beams simultaneously. We discovered that, with some regularity, we would receive both direct path and bottom bounce signals from the contact. The different signals would arrive on different beams because of their paths through the water. The intersection of a direct path line of bearing with a bottom bounce hyperbola produced an estimate of the target's range without having to maneuver. Exercise reconstruction showed our estimates to be within a few percent of the target's range. Under the leadership of our superb Executive Officer, Lieutenant Commander Dan Bacon, we documented the tactics we had developed for maneuvering the sub, conducting the sonar searches, and plotting in a tactical memo and submitted it to Commander, Submarine Forces Pacific. He replaced our cover with his, and distributed it as a Tactical Memorandum to the fleet. Within a year, we received the BQR-23 that processed four beams simultaneously. We then deployed with this sonar system, and other prototype sensors and processors, for operations in the western Pacific. Deploying with prototype equipment was routine in the submarine force. During World War II U.S. submarines could attack only surfaced enemy submarines.[11] In 1949, the submarine force created Submarine Development Group 2 and tasked it with antisubmarine warfare (ASW) as part of an effort to preserve the submarine force structure during demobilization. Within twenty years, the U.S. submarine force went from having essentially no ASW capability to becoming the dominant ASW force in the world. Following their motto of "**Science, Technology, Tactics**", the Group employed a program of designing, conducting, and reconstructing exercises to develop tactics for prototype systems, and reconstructing submarine performance during operations using extensive data collected during patrols.[12] Using the Group's methodology, we were able to exploit the STASS and the BQR-20 series digital displays and document proven tactics for the fleet that significantly improved the U.S. advantage over Soviet submarine forces within an 18 month period. In contrast, installing the first submarine digital combat system in the shipyard demonstrated challenges that occur when developing systems without prototyping. The system had no feature for entering bearings directly from the periscope. Apparently, the engineers thought that all approach and attack would use sonar only. We also were told that adding hyperbolic ranging to the software in the central computer complex, which serviced the sonar and fire control system, would take at least a decade. Stand-alone computers came to support search planning and target motion analysis since the integrated system was incapable of rapid change.

Coordination in Direct Support

Admiral Rickover had pushed through the development of the *Los Angeles*-class submarines by arguing that their higher speed would allow them to screen a carrier battle group.[13] The major problems were communicating with submarines to keep them on station as the battle group maneuvered, to direct them to prosecute contacts detected by other battle group platforms, and to prevent other battle group ASW forces from attacking them. Also, based on the way that the U.S. targeted German U-boat radio transmissions during World War II, our silent service routinely disabled its radio transmitters while on patrol to prevent detection. Standard submarine communications involved the submarine getting an antenna to the

surface for broadcasts that were repeated for eight hours on a two-hour cycle. The submarine restricted its speed to a few knots when at communications depth, both to prevent anyone seeing the wake of the periscope and to keep its floating wire antenna on the surface. Thus the submarine could best communicate at scheduled intervals, and could not transit at battle group speeds while communicating. Rear Admiral Guy H.B. Shaffer took the methods he had used commanding Submarine Development Group 2 with him to the Naval Electronic Systems Commands program office PME-108.[14] He established the Coordination in Direct Support (CIDS) program to develop means to communicate with submarines providing direct support to carrier battle groups. The Submarine Analysis Notebook provided the methodology and data required for assessing submarine ASW performance. The first step in the CIDS program was to develop a Fleet Exercise Analysis Guide that provided a conceptual battle group ASW process and performance metrics.[15] PME-108 then worked with the Tactical Development and Evaluation (TAC D&E) Program and the numbered fleets to schedule participation in their exercises, and invited the Navy laboratories to provide prototype communications systems for submarine communications. The prototypes included everything in the electromagnetic spectrum from blue-green lasers to Extremely Low Frequency (ELF) radios and a variety of acoustic communication methods.[16] For each exercise a team would work with relevant commands to design the exercise and develop data collection plans. The team would then ride key ships in the exercise providing advice on accomplishing exercise training and tactical development objectives, and overseeing the data collection. Following the exercise, the team would reconstruct and analyze the event in full, including documenting the timelines for each ASW interaction and every ASW communication over every communications path. This approach allowed prototypes to be evaluated not just as stand-alone systems, but demonstrated their value both in enhancing communications as part of a suite of systems operating simultaneously and in accomplishing the mission of protecting the carrier from submarines attacking with torpedoes and cruise missiles. Occasionally a laboratory would offer a prototype that was operationally unsuitable. One such system was a shaped buoy weighing several thousand pounds to be towed behind a submarine at depth and speed to push an antenna to the surface. Had the buoy hit a surface vessel, or submarine at shallower depth, it would have had the impact of a torpedo without the explosion. Documenting every step of the communications path demonstrated the delays created by communications controlled by the submarine operating authority ashore. This led the submarine force to provide Submarine Element Coordinators (SEC) at sea with the battle group. The exercises explored many operational schemes with these SECs adjusting submarine broadcast schedules and using ELF or acoustic "*bell-ringers*" to call the submarine to communications depth for higher data rate communications. After 10 fleet exercises conducted over a three-year period involving all the numbered fleets, the CIDS program demonstrated that the tactical concept for using submarines as an outer screen moving with the carrier battle group was infeasible. This led to alternative schemes for employing submarines supporting task groups. The communications data proved valuable and was incorporated in the Navy's Warfare Environment Simulator which allowed teams playing task group platforms on different terminals to receive information with realistic time delays.[17] Over time, this became the Navy Simulation System, but lost its original purpose of focusing on command and control issues using fleet data.

Over-the-Horizon Targeting

Shortly after the command and control fleet exercises, the Navy began deploying Harpoon and was getting ready to deploy Tomahawk missiles to the fleet. So RADM Shaffer established an Over-the-Horizon Targeting (OTH-T) program within PME-108. The approach followed the CIDS program; developing a fleet exercise analysis guide, designing exercises to incorporate prototype systems and tactics, collecting data, and conducting analyses. The Mediterranean, with its high shipping density and many islands, provided the most challenging environment for OTH-T. The exercises were again successful in demonstrating that the technology and tactics were insufficient to support the proposed concepts for anti-ship Tomahawk use. This and the abundance of targets ashore were major factors in emphasizing land attack versus anti-ship versions of the Tomahawk missile.

Advanced Technology Panel

By the late 1970s, Navy efforts to develop special intelligence sources provided deep penetration of Soviet Navy thinking and practices.[18] The CNO repurposed the Navy's Advanced Technology Panel (ATP), created in the 1970s, to become the main customer for this highly restricted intelligence.[19] The ATP was a small group of the senior admirals on his staff, his top '*thinkers*', who were cleared primarily to review special programs, but did a lot more.[20] Working closely with the Navy laboratories, the leadership could deliver counters to what the Soviets were deploying within months to a year or two of having firm intelligence on their systems. CNO Admiral Tom Hayward, on the advice of then Under Secretary of the Navy Robert Murray, formed a Strategic Studies Group of six promising Navy officers selected personally by him and two Marines at the Naval War College in 1981. Murray characterized the SSG as changing captains of ships into captains of war, employing terms that Winston Churchill used when he said that he needed more of those in World War I. That fall, the ATP led by Vice CNO Admiral Bill Small was looking for ways to game using new, sensitive intelligence. In January 1982, the SSG was asked to develop concepts employing the new intelligence. The SSG held an extensive war game in April 1982. Admiral Small brought the ATP to Newport for two days at the conclusion of the game to review the results. The concepts used in the game became the foundations for the 1980s Maritime Strategy and rapidly changing war plans. The ATP was able to focus special programs on providing capabilities tailored to executing the new war plans.[21]

Two Different Paths: Nuclear Submarines and Distributed Surface Combat Power

Prototyping should not be restricted only to the payloads on vessels. In 1951, then Captain Hyman G. Rickover received authorization to build nuclear powered submarines. **USS *Nautilus* (SSN 571)** was commissioned in 1954 with a pressurized water reactor. The Navy then commissioned:

- The **USS *Seawolf* (SSN 575)** with a liquid metal cooled reactor in 1957. This design presented too many risks and was quickly replaced.
- The **USS *Triton* (SSRN 586)** in 1959, a large radar picket submarine with two reactors.
- The **USS *Tullibee* (SSN 597**) in 1960, a very small, quiet submarine with a small reactor.
- **The USS *Jack* (SSN 605)** in 1967 with direct drive and counter-rotating shafts and propellers.

These submarines, along with the small classes of SSNs built between the prototypes, explored the design space, adapted design features, and informed the building the following classes of nuclear submarines.[22] The large capacity of the **USS *Hallibut* (SSGN 587**), designed to shoot Regulus nuclear cruise missiles, allowed it to adapt to different missions over its service life. In 1996, the CNO Strategic Studies Group briefed its concepts for dispersed and distributed surface power to the CNO.[23] The Group had in mind fast, stealthy ships of several hundred tons capable of mounting modular payloads for different missions. They anticipated that the Navy would explore the design space with prototypes, as it did with nuclear submarines. Instead, DoD acquisition processes led to the Littoral Combatant Ship. Rather than using a range of small and large prototypes using differing propulsion concepts, the Navy ended up with two much larger ship classes that have had many early difficulties.

Conclusion

The DoD acquisition system has come to believe that we must precisely predict the threat decades into the future, optimize designs by spending many million dollars on computer analysis, and then commit billions of dollars for procurement, without any of the experience and operator feedback provided by prototypes. This developmental approach incurs major cost, schedule, and performance risks because the future remains stubbornly uncertain – just as it always has been. A better alternative is to prototype operational systems and platforms rapidly, providing agility to adapt to emerging threats and take advantage of emerging technology. Programming, budgeting, and contracting processes present major hurdles. Though routine acquisition procedures do not support such agility, Other Transaction Authority and similar processes authorized by Congress should be employed to their maximum extent. However, to do so effectively will require reinvigorating experimenting with

prototypes in fleet exercises in ways similar to Submarine Development Group 2, the CIDS and OTH-T programs, and early nuclear submarine force development.

Captain John T. Hanley, Jr., USNR (Ret.) began his career in nuclear submarines in 1972. He served with the CNO Strategic Studies Group for 17 years as an analyst and Program/Deputy Director. From there in 1998 he went on to serve as Special Assistant to Commander-in-Chief U.S. Forces Pacific, at the Institute for Defense Analyses, and in several senior positions in the Office of the Secretary of Defense working on force transformation, acquisition concepts, and strategy. He received A.B. and M.S. degrees in Engineering Science from Dartmouth College and his Ph.D. in Operations Research and Management Sciences from Yale. He wishes that his Surface Warfare Officer son was benefiting from concepts proposed for naval warfare innovation decades ago. The opinions expressed here are the author's own, and do not reflect the positions of the Department of Defense, the US Navy, or his institution.

Endnotes

1. For example see Barber, Arthur H. "For War Winning Innovation, Fix the Process." Naval Institute Proceedings, October 2016 and National Academy of Sciences-Engineering-Medicine. "The Role of Experimentation Campaigns in the Air Force Innovation Lifecycle." Washington DC: National Academies Press, 2016.
2. This type of experimentation involves trying out concepts and technology at sea, and learning from the results. Attempts by the former Joint Forces Command to restrict the concept of experimentation to hypotheses without control cases were inappropriate, misused, and misguided.
3. U.S. Code Title 10 Chapter 87.
4. Charles Nemfakos, Irv Blickstein, et. al. The Perfect Storm: The Goldwater-Nichols Act and Its Effect on Navy Acquisition. Santa Monica: RAND, 2010.
5. David Packard, President's Blue Ribbon Commission Defense Management, A Quest for Excellence: Final Report to the President, Washington, D.C., June 30, 1986.
6. John T. Hanley, Jr. "Changing the DoD's Analysis Paradigm: The Science of Wargaming and Combat/Campaign Simulation." Naval War College Review, Winter 2017.
7. Chip Heath, Dan Heath. *Switch: How to Change Things when Change is Hard*. (New York: Broadway Books, 2010).
8. The first installation of the BQQ-5 and Mk-117 was not called a prototype at the time. However, the submarine museum adjacent to Sub Base New London now characterizes it as a prototype.
9. A story on the waterfront was that the BQR -20 resulted from a sonar Chief in San Diego who observed a mechanic using a digital processor when diagnosing his car engine. He obtained a device and connected it into his sub's system, demonstrating an ability to see distinct frequencies.
10. Ekelund's story is a classic example of junior officer innovation. See http://www.public.navy.mil/subfor/underseawarfaremagazine/issues/archives/issue_15/ekelund.html .
11. Captain Gene Porter, USN (Retired) informed me of an action on Action of 9 February 1945 where the Royal Navy submarine HMS *Venturer* sank the U-boat U-864 in the North Sea off the Norwegian coast. This action is the first and so far only incident of its kind in history where one submarine has intentionally sunk another submarine in combat while both were fully submerged.
12. For a comprehensive account see "Submarine Warfare and Tactical Development: A Look – Past, Present, and Future: Proceedings of the Submarine Development Group TWO & Submarine Development Squadron TWELVE 50th Anniversary Symposium 1949-1999," U.S. Naval Submarine Base Groton, Connecticut: Submarine Development Squadron TWELVE, 1999.
13. The *Los Angeles* or 688 class had twice the shaft horsepower of the proceeding 637 class, and cost about twice as much. It originally sacrificed under ice and electronic surveillance capabilities to keep the costs down. The submarine force was under the gun from Secretary of Defense MacNamara's Systems Analysis Office to demonstrate that the benefits of about 20% more speed were worth the cost. In fact, since both classes had the same sonars and weapons, the tactical speeds for detecting targets attack ranges were the same, and the 637 could conduct under ice and electronic surveillance missions. Captain Gene Porter, USN (Retired) provided oversight from OSD's Systems Analysis Office. Studies demonstrated that the extra 688 speed was most useful in evading enemy torpedoes, but not worth twice the cost of the submarine.
14. Submarine Development Group 2 became Submarine Development Squadron 12 in the mid-1970s. The Naval Electronics Systems Command is now the Space and Naval Warfare Systems Command (SPAWAR).
15. The author contributed to writing the CIDS Fleet Exercise Analysis Guide and wrote the OTH-T Fleet Exercise Analysis Guide.
16. ELF frequencies are 3-30 Hertz, corresponding to wave lengths 10,000 to 100,000 kilometers. The data rate is a few characters per minute. ELF energy penetrates seawater to a greater depth than higher frequencies, allowing the submarine to remain at depth and receive communications. The prototype ELF transmitter was on the order of 100 miles long, located in upper Michigan and required the submarine to tow a long antenna. The program used a bull under the transmitter to monitor any biological effects.
17. The author also used this data in 1982 to model and analyze the first Chief of Naval Operations Strategic Studies Group Combined Arms ASW concept for rapidly gaining forward sea control and attacking Soviet submarines in their bastions. This work resulted in quickly changing U.S. naval war plans. Over their careers, Admiral William A. Owens expanded the original SSG concept into his Systems-of-Systems ideas and Vice Admiral Arthur Cebrowski into his Net Centric Warfare concepts. John T. Hanley, Jr. "Creating the 1980s Maritime Strategy and Implications for Today." *Naval War College Review*, 2014: 11-30 provides more details.
18. Christopher Ford and David Rosenberg, *The Admirals' Advantage: U.S. Navy Operational Intelligence in World War II and the Cold War* (Annapolis; MD: Naval Institute Press, 2005), p. 84.
19. John B. Hattendorf, *The Evolution of the U.S. Navy's Maritime Strategy, 1977–1986,* Newport Paper 19 (Newport, R.I.: Naval War College Press, 2004), pp. 32-33.
20. Admiral William N. Small, U.S. Navy (Retired), "Oral History." Interviewed by David F. Winkler, Naval Historical Foundation, 1997, p. 56.
21. Ibid. Hanley 2014 and Petrucelli, Joe. 2021. "John Hanley on Convening the Strategic Studies Group and Assessing War Plans." *CIMSEC*. March 23. Accessed April 26, 2021. https://cimsec.org/john-hanley-on-convening-the-strategic-studies-group-and-assessing-war-plans/.
22. The principal argument against such prototypes is the cost of maintaining one-off designs. Space in this article does not permit an exploration of how technologies such as 3D printing could change this calculus.
23. The author was Deputy Director of the CNO Strategic Studies Group at this time.

Source: https://cimsec.org