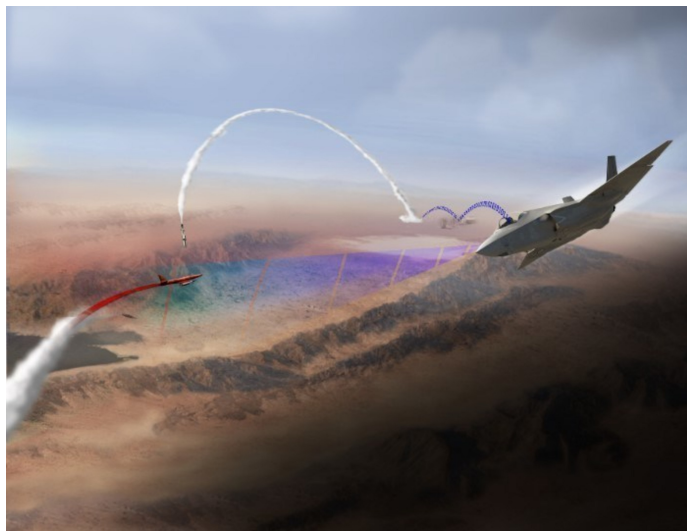


The Kill Web and Hypersonic Cruise Missiles: The Future is Now



It is not just about getting better intelligence through space-based systems to have an historical record of what killed you.

It is about the kill web executing the kill function.

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By Ed Timperlake

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INTRODUCTION

President Putin has recently threatened a direct attack against the United States with nuclear weapons if we do not comply with his strategic approach to Europe and the West.

The Russian PR machine has kicked in.

Notably, President Putin focused on the employment of nuclear tipped hypersonic cruise missiles launched from his navy's submarines off of the East Coast of the United States.

In effect, what Putin did was to sound "General Quarters" for a combat proven warfighting Navy to go on high alert.

The United States has now joined allies like Denmark which are the focus for the Russians of the use of nuclear weapons threats as part of normal diplomacy.



But Putin has really picked the wrong adversary; one that can not only shoot back with devastating results on Russia itself but operates in ways that can shred his own navy.

The greatest intangible strength of the US Sea Services is the fact that the diverse backgrounds of all Americans are forged together into a fighting Navy based on honor, and team play that has as it's very foundation the principle of always being a performance based meritocracy.

The greatest tangible strength is that from the heavens to the deepest of the deep, the American Navy has world class state-of the art weapons and platforms integrated seamlessly into an evolving kill web, nuclear tipped.

No platform fights alone and the Navy always "trains trains trains" for evolving contingencies.

REFOCUSING ON CORE THREATS

"Putin also announced the coming deployment of the new Zircon hypersonic missile for the Russian navy, saying it's capable of flying at nine times the speed of sound and will have a range of 1,000 kilometers (620 miles).

He said the Zircon program will not be too costly as the missile has been designed to equip Russia's existing surface ships and submarines." ¹

"Potie Poot" as he was called by President Bush 43 or the man President Obama could do flexible business with after the 2012 Election has yet again miscalculated. Our President and the military will take his threats

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very seriously and act appropriately to show and not tell him that threatening United States with a sub launched nuclear strike is not a good plan.

The Cold War legacy to this day is that the number one event that can destroy America is a successful attack by an enemy that can launch a multiple nuclear warhead strike on the United State.

Everything else that currently takes probably 99% of our worries in print is second order.

This is not a bad thing because it reflects that our national command authority and Commander-in Chief are getting it right by refocusing our defense efforts on those peer competitors which seek to hurt us most.

Today a barrage fire targeting America with a massive strategic strike using nuclear warheads by Russia or China is still the ultimate strategic threat. The American military triad of ready launch missile in silos, USN Boomers on station and strategic bombers comprise our strategic response force that is standing ever vigilant.

Detering Russia and China with massive retaliation is the easiest theory to understand in this murky 21st Century “Second Nuclear Age”.

In a seminal book Professor Paul Bracken of Yale University underscored the challenge of deterrence in the *Second Nuclear Age*:

What I wanted to do was to shift the debate.

There are many, many studies of books about deterrence, but deterrence really needs to be broken up into what I would call smaller chunks, which really gets into the subject of escalation and de-escalation.

I don't think it's possible to talk about deterrence and not talk about escalation and de-escalation.

In his book, he argued that mastering the maneuver space for the threat to use nuclear weapons was part of escalation dominance, which leaders who have access to nuclear weapons have access to and work to master.

Nuclear weapons thus made the calculation of “next moves” central to strategy. A mistake, a careless decision, or a miscalculation could lead to a lot more than political embarrassment. Big decisions over war or peace were broken down into lots of smaller ones about the use of force and where it might lead.

And even the smallest decisions got high-level attention. In the Berlin crisis of 1948, the decision as to the kind of rifles U.S. guards carried on trains running to Berlin, M-1s or carbines, was kicked all the way up to the White House.

The skill needed to identify these smaller decisions was learned on the job. It was not anticipated. Everything said here about the calculated use of force to achieve various purposes, basing decisions about using force on estimates of an opponent's reaction, breaking down sweeping decisions on war or peace into much smaller “chunks,” and high-level attention given to micro moves—none of this was foreseen. It was “discovered” by national leaders and, even then, usually after they got into a crisis.²

What the Putin threat is really about is putting on the table elements of trying to dominate escalation management.

“If you respond to my violations of the INF treaty, by actually reshaping your capabilities to defense your allies, I would move my chips on the table and move to destroy you at the heart of government with a new technology which you have no response to.”³

Sounds interesting: but let us look at how Putin is working to shape an escalation declaratory control policy and how the United States can not just respond, but pre-empt?

This is not about arms control; it is about the maneuver space in a pre-crisis space in which declaratory policy coupled with capabilities can shape outcomes, without even firing a shot.

DEALING WITH THE SUB-LAUNCHED HSCM AS A “SMALLER CHUNK” OF ESCALATION DOMINANCE

Developing and showcasing a sub-based hypersonic cruise missile can be considered a “smaller chunk” in any escalation/de-escalation cycle.

Since the beginning of the first nuclear age into the second not only are the technological capabilities and intentions of force capabilities of paramount importance, it is also the intangibles of information war (IW) statements that directly impact on Professor Bracken’s point about any ops-tempo in times of crises.

Russia’s Putin understands Information War messaging about the use of nuclear weapons:

“All Russians will go to heaven” as recently stated by a “deeply” religious former KGB Officer.

“About a third of the way through, Putin conjured the specter of nuclear war, most likely with the United States, though he didn’t name the enemy explicitly.

“As martyrs, we will go to heaven,” he promised.

“And they will just croak because they won’t even have time to repent.”⁴

What a really nasty statement.

But it almost certainly aimed at Islamic extremists and is designed to take off the table any advantage that would accrue to those who believe that Russians fear death at the hands of Islamic extremists.

Now in addition to his IW mysticism he has personally threatened America, especially President

Trump and his family, by having the White House and Camp David mentioned on his target list.

This is threatening on so many levels.

The US Navy is standing ready at all levels of combat effectiveness, because in over a hundred years of successful Anti-Submarine Warfare (ASW) from the Chief of Naval Operations down Navy Leadership has always recognized that the future is now in standing ready to meet threats.

The President of Russia in February 2019 directly threatened the US with a nuclear strike from his submarine fleet off our East Coast. He and his war planners must be puzzled by a simple question; how did the United States already anticipate this threat?

Navy Chief of Naval Operations seemingly knew that Putin would eventually make such a bold threat.

President Putin and your sailors meet our newly reestablished 2nd Fleet established by CNO Admiral John Richardson, who graduated from the U.S. Naval Academy in 1982 with a Bachelor of Science in Physics.

As Admiral Richardson noted at the ceremony establishing the command:

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“Although deeply consequential, the meaning of this establishment can be summarized simply as a dynamic response to a dynamic security environment — a security environment clearly articulated in the National Defense Strategy,” said Richardson.

“We first need to understand this competitive security environment and why it demands every ounce of our tenacity, ingenuity and fighting spirit. Then we can focus on the mission and how best to accomplish it; 2nd Fleet will enhance our capacity to maneuver and fight in the Atlantic, and as a result, help to maintain America’s maritime superiority that will lead to security, influence and prosperity for our nation.”⁵



Figure 1 The photo shows Commander, U.S. 2nd Fleet Vice Adm. Andrew Lewis talking with Chief of Naval Operations Adm. John Richardson and Commander, U.S. Fleet Forces Adm. Chris Grady, following the 2nd Fleet Establishment Ceremony aboard the nuclear aircraft carrier USS George H.W. Bush (CVN 77). August 24, 2018.

Put in blunt terms, the US Navy has anticipated what Putin is now trying to establish as an advantage in a future battle.

But the Navy is clearly working the challenge of preparing and training for a 21st century battle of the Atlantic.

And this time, the US Navy is leveraging not just its own service technology but the full panoply of what the joint and allied forces can provide as well to shape a nuclear-nuclear-tipped kill web that can dominate in a crisis and provide significant maneuver space for the President in dealing with Putin in a pre-crisis situation.

It is not about assuming strategic dominance with a so-called anti-access and area denial approach; it is about having to confront a 21st century combat force which is constantly innovating and training to defeat a peer competitor.

As the CNO noted in 2016:

“To ensure clarity in our thinking and precision... We’ll no longer use the term A2/AD as a stand-alone acronym that can mean all things to all people or anything to anyone – we have to be better than that.”

“Since different theaters present unique challenges, ‘one size fits all’ term to describe the mission and the challenge create confusion, not clarity. Instead, we will talk in specifics about our strategies and capabilities relative to those of our potential adversaries, within the specific context of geography, concepts, and technologies.”⁶

Remember Putin — we shoot back.

And before that we have significant maneuver forces to affect pre-crisis decision making of even the consummate chess player like Putin.

THE IMPACT OF A “READY ON ARRIVAL” US NAVY ON CRISIS MANAGEMENT

The famous Navy saying “we are ready now” also means Navy R&D focus is to always be ever vigilant in building for the future. The future is now but it is anchoring as well a way ahead.

In fact, for 2025 and beyond, the US Navy is the gold standard for the world for R&D research in understanding the technological imperative of an action/reaction cycle of weapons development against a reactive enemy.

We have moved from an organic Carrier Battle Group to a kill web “no platform fights alone” approach which expands the impact of the carrier on the battlespace and in turn the carrier can leverage joint capabilities not present on the carrier itself.

There is also the great historical demonstrated strength in the combat history of the Navy with their famous “Ready on Arrival” combat ethos.

With the current endless wars, a lot of attention has been focused on the combat effectiveness of the large deck carrier.

When a Carrier Strike Group, previously called a Carrier Battle Group sorties into harm’s way it is a global power projection combat capability.

In 1966 the US Navy made [a short movie](#) about what was then called an “Attack Carrier.”

The movie describes going to flight quarters and conducting combat air operations from an aircraft carrier off Vietnam.

The US Navy when sent in harm’s way does whatever is asked to their last full measure, combat is their profession and loyalty to the Constitution not politics is their code.

“Ready on Arrival” highlights a simple truth evident today off Afghanistan that the direct lineage of the large deck aircraft carrier is an American point of pride.

A modern carrier ready today launching into Afghanistan personifies the fundamental point of the movie that the U.S. can with unexpected events put a Carrier on Station to support friends and confront enemies.

Note that at times, as stated, the surface Navy can also undertake independent offensive operations, as the Russians in combat support for the President of Syria recently found out, after the Syrian President used chemical weapons on his opponents:

“They that go down to the sea in ships that do business in great waters.”

Psalms 107:23-31

When President Trump gave the go order to attack Shayrat Air Base Syria, where a chemical attack had been launched, two US Navy surface warships stood ready to implement the order.

In one shining moment with Tomahawks fired from USS Porter and USS Ross, the world knew a new Commander-in Chief was at the helm.

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It was reported that 59 of the 60 Tomahawks hit the intended target. Our way of war was to actually warn the Russians to minimize any chance of Russian's being hit or killed — how nice for them.

The USS Porter and USS Ross successful attack showcased the command structure of the 21st Century Navy.

No finer complement can be given to the 21st Century navy and the dynamic and extremely successful contribution's being made by the admission of women to the US Naval Academy than seeing the Commanding Officer of USS Porter have her crew earn an historic famous Flag Hoist "Bravo Zulu" for Job Well Done.

Cmdr. Andria Slough graduated from the academy with a Bachelor of Science degree in ocean engineering. She serves as the commanding officer of the USS Porter, a Navy destroyer in the eastern Mediterranean Sea.

Performance counts from day one regardless of how one earns a commission.

The Skipper of the USS Ross, Commander Russell Caldwell, hails from Johannesburg, South Africa. Commander Russell Caldwell graduated the University of Kansas with a Bachelor of Science in Political Science and was commissioned on January 10, 1998.

The other "ready now" teams engaged in direct combat have been the special warfare community, the Navy SEALs, who also work with the Navy's Silent Service.

I had the opportunity in December 2011 to see an advanced preview of the movie "Act of Valor," an action thriller about US Navy SEALs, and my first impression was that it was sending a very powerful message to the enemies of America: Navy SEALs will be coming and you will be killed.

It was refreshing and rather unique to see a movie identify the real enemy; fanatical, death-loving Islamist extremists and no politically correct BS with surrogate enemies such as machines, fighting robots or space aliens.

Also appreciated was how the film depicted the military without emoting or second-guessing their chosen profession.

The almost obligatory Hollywood "Oh the inhumanity of it all!" moment did not arrive.

Some SEAL teams may have pensive introspective poets or tortured souls in their ranks but not in this movie.

The real payoff of taking the risk of using actual SEALs was the fluidity of their motion.

They moved like real warriors.

Based on my many years of experience, the real military is just as it is depicted in the film.

The physical movement, use of technology, submarine featured, and firepower and an ending that provides a sobering reminder of the human cost of fighting terrorism make this film outshine your standard action/adventure movie.

What President Putin and his IW propaganda team do not understand is that as a Carrier Strike Force goes forward the Admiral and his entire team are ever vigilant about unknown submarines.

Just because the Navy doesn't talk much about all aspects of Anti-Submarine Warfare doesn't mean they ignore that domain, in fact it is just the opposite.

21ST CENTURY ANTI-SUBMARINE CAPABILITY AS A KEY ELEMENT FOR SHAPING ESCALATION DOMINANCE

The famous battle-winning lineage of the Navy's Anti-submarine force (ASW) is being called to "Sound General Quarters Battle Stations" because the President of Russia's submarines with low flying air-breathing nuclear tipped hypersonic cruise missiles are directly threatening America.

The significant change in the direct threat to the United States, which the Trump Administration has highlighted in last year's National Security strategy, was presaged by the NORAD/NORTHCOM Commander Admiral Bill Gortney, a clear embodiment of the fighting navy, in our 2016 interview with him in his office at Colorado Springs.

Question: The Russians are not the Soviets, but they are generating new capabilities, which clearly provide a need to rethink homeland defense.

How would you characterize the Russian dynamic?

Answer: With the emergence of the new Russia, they are developing a qualitatively better military than the quantitative military that they had in the Soviet Union.

They have a doctrine to support that wholly government doctrine. And you're seeing that doctrine in military capability being employed in the Ukraine and in Syria.

For example, the Russians are evolving their long-range aviation and at sea capabilities. They are fielding and employing precision-guided cruise missiles from the air, from ships and from submarines.

Their new cruise missiles can be launched from Bears and Blackjacks and they went from development to testing by use in Syria. It achieved initial operating capability based on a shot from a deployed force.

The Kh-101 and 102 were in development, not testing, so they used combat shots as "tests," which means that their capability for technological "surprise" is significant as well, as their force evolves.

The air and sea-launched cruise missiles can carry conventional or nuclear warheads, and what this means is that a "tactical" weapon can have strategic effect with regard to North America.

Today, they can launch from their air bases over Russia and reach into North American territory.

The challenge is that, when launched, we are catching arrows, but we are not going after the archers.

The archers do not have to leave Russia in order to range our homeland.

And with the augmentation of the firepower of their submarine force, the question of the state of our anti-submarine warfare capabilities is clearly raised by in the North Atlantic and the Northern Pacific waters.

What this means for NORAD as well is that limiting it to air defense limits our ability to deal with the multi-domain threat.

It is an air and maritime threat and you need to go on that tack and defense through multiple domains, not simply the classic air battle.⁷

The NORAD Commander was clearly anticipating the core requirement for an air-sea integrated force to deal with the evolving Russian challenge, including the nuclear one.

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Clearly, a key element of shaping an effective warfighting/deterrent force is the evolving US and allied anti-submarine capability.



Figure 2 This is a notional rendering of the 10 and 2 O’Clock challenge. It is credited to Second Line of Defense and not in any way an official rendering by any agency of the US government. It is meant for illustration purposes only.

And it is not just about history but a key element of the training and combat development dynamics of the kill web navy.

The ASW community like their fellow combats Naval Aviators and their SEAL team partners, have been day-in and day out 24/7 “training training training.”

And as we have seen at warfighting centers like Navy Fallon or at Jax Navy where the P-8 has been stood up, training encompasses the dynamics of change for concepts of operations to defeat an enemy fleet.

A key dynamic of change is how the Navy is working surface fleet and air integration to extend the reach and lethality of the fleet and to expand kill web capabilities of the ASW force.

During our visit to Fallon in 2017, Admiral “Hyfi” Harris highlighted the key development and evolving capability⁸:

The SWO boss, Admiral Rowden, has been pretty adamant about the benefits of their Warfighting Development Center, the Surface and Mine Warfighting Development Center.

“SMWDC has been, in my mind, going full bore at developing three different kinds of warfare instructors, WTIs.

“They have an ASW/ASUW, so anti-surface and anti-submarine warfare officer.

“They have an IAMD officer and they have an expeditionary warfare officer. We are watching young lieutenants share with their bosses in a training environment, specifically during IADC (Integrated Air Defense Course).

“This is probably not the way we want AEGIS set up, or how we want the ship to be thinking in an automated mode.

“We may not previously have wanted to go to that next automated step, but we have to because this threat is going to force us into that logic.

And you're seeing those COs, who were hesitant at first, say, "Now after that run in that event, I get it. I have to think differently.

"Admiral Rowden talks about distributed lethality and they are getting there rapidly.

And the addition of the Triton unmanned system as well as the new P-8s are part of an enhanced airborne detection and strike capability against enemy submarines.

The Navy and several allies are replacing the venerable P-3 with a dyad, the P-8 and the Triton.

During a visit to Jax Navy in 2016, the ASW community they shared their perspectives on the way ahead, which underscored the evolving kill web approach facing Russian submarines seeking to execute the nuclear mission described by President Putin.

Or put in other terms, the Russian President needs to realize that he is not fighting the US Navy of the Cold War years; he is facing a kill web enabled US Navy able to leverage a variety of assets to destroy his maritime assets.

In this sense, we are the reactive enemy against Putin's declaratory strategy and arms buildup.

We published a report on our visit to Jax Navy in 2016 and provided the following over to the report which outlined key elements of how the Navy was positioning itself to provide building blocks for escalation dominance against peer adversaries.

On May 23 and 24, 2016, during a Jacksonville Naval Air Station visit, we spent time with the P-8 and Triton community which is shaping a common culture guiding the transformation of the ASW and ISR side of Naval Air. The acquisition term for the effort is a "family of systems" whereby the P-3 is being "replaced" by the P-8 and the Triton Remotely Piloted Aircraft.

But clearly the combined capability is a replacement of the P-3 in only one sense – executing the anti-submarine warfare function. But the additional ISR and C2 enterprise being put in place to operate the combined P-8 and Triton capability is a much broader capability than the classic P-3. Much like the Osprey transformed the USMC prior to flying the F-35, the P-8/Triton team is doing the same for the US Navy prior to incorporating the F-35 within the carrier air wing.

In addition to the Wing Commander and his Deputy Commander, who were very generous with their time and sharing of important insights, we had the opportunity to interviews with various members of the VP-16 P-8 squadron from CO and XO to Pilots, NFOs and Air Crew members, along with the wing weapons and training officer, the Triton FIT team, and key members of the Integrated Training Center. Those interviews will be published over the next few weeks.

The P-8/Triton capability is part of what we have described as 21st century air combat systems: software upgradeable, fleet deployed, currently with a multinational coalition emerging peer partnership. Already the Indians, the Aussies and the British are or will be flying the P-8s and all are in discussions to build commonality from the stand-up of the P-8 Forward.

Software upgradeability provides for a lifetime of combat learning to be reflected in the rewriting of the software code and continually modernizing existing combat systems, while adding new capabilities over the operational life of the aircraft. Over time, fleet knowledge will allow the US Navy and its partners to understand how best to maintain and support the aircraft while operating the missions effectively in support of global operations.

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Reflecting on the visit there are five key takeaways from our discussions with Navy Jax.

A key point is how the USN is approaching the P-8/Triton combat partnership, which is the integration of manned, and unmanned systems, or what are now commonly called “remotes”. The Navy looked at the USAF experience and intentionally decided to not build a the Triton “remote” operational combat team that is stovepiped away from their P-8 Squadrons.

The team at Navy Jax is building a common Maritime Domain Awareness and Maritime Combat Culture and treats the platforms as partner applications of the evolving combat theory. The partnership is both technology synergistic and also aircrew moving between the Triton and P-8

The P-8 pilot and mission crews, after deploying with the fleet globally can volunteer to do shore duty flying Tritons. The number of personnel to fly initially the Tritons is more than 500 navy personnel so this is hardly an unmanned aircraft. Hence, inside a technological family of systems there is also an interchangeable family of combat crews.

With the P-8 crews operating at different altitudes from the Triton, around 50K, and having operational experience with each platform, they will be able to gain mastery of both a wide scale ocean ISR and focused ASW in direct partnership with the surface navy from Carrier Strike Groups, ARG/MEUs to independent operations for both undersea and sea surface rather than simply mastering a single platform.

This is a visionary foundation for the evolution of the software upgradeable platforms they are flying as well as responding to technological advances to work the proper balance by manned crews and remotes.

The second key point is that the Commanders of both P-8 aviator and the soon to be operational Triton community understand that for transformation to occur the surface fleet has to understand what they can do. This dynamic “cross-deck” actually air to ship exchange can totally reshape surface fleet operations. To accelerate this process, officers from the P-8 community are right now being assigned to surface ships to rework their joint concepts of operations.

Exercises are now in demonstration and operational con-ops to explain and real world demonstrate what the capabilities this new and exciting aspect of Naval Air can bring to the fleet. One example was a recent exercise with an ARG-MEU where the P-8 recently exercised with the amphibious fleet off of the Virginia Capes.

The third key point is that the software upgradeability aspect of the airplane has driven a very strong partnership with industry to be able to have an open-ended approach to modernization. On the aircraft maintenance and supply elements of having successful mission ready aircraft it is an important and focused work in progress both inside the Navy (including Supply Corps) and continuing an important relationship with industry, especially at the Tech Rep Squadron/Wing level.

The fourth point is how important P-8 and Triton software upgradeability is, including concurrent modification to trainer/simulators and rigorous quality assurance for the fidelity of the information in shaping the future of the enterprise. The P-8s is part of a cluster of airplanes which have emerged defining the way ahead for combat airpower which are software upgradeable: the Australian Wedgetail, the global F-35, and the Advanced Hawkeye, all have the same dynamic modernization potential to which will be involved in all combat challenges of maritime operations.

It is about shaping a combat learning cycle in which software can be upgraded as the user groups shape real time what core needs they see to rapidly deal with the reactive enemy. All military technology is relative to a reactive enemy. It is about the arsenal of democracy shifting from an industrial production line to a clean room and a computer lab as key shapers of competitive advantage.

The fifth point is about weaponization and its impact. We have focused for years on the need for a weapons revolution since the U.S. forces, and as core allies are building common platforms with the growth potential to operate new weapons as they come on line. The P-8 is flying with a weapon load out from the past, but as we move forward, the ability of the P-8 to manage off board weapons or organic weapons will be enabled.

For example, there is no reason a high speed cruise or hypersonic missile on the hard points of the P-8 could not be loaded and able to strike a significant enemy combat asset at great distance and speed. We can look forward to the day when P-8s crews will receive a Navy Cross for sinking a significant enemy surface combatant.

In short, the P-8/Triton is at the cutting edge of naval air transformation within the entire maritime combat enterprise. And the US Navy is not doing this alone, as core allies are part of the transformation from the ground up.⁹

A LOOK BACK AT THE HISTORY OF US NAVY ASW CON-OPS AND CAPABILITIES

The view of the US Navy and its approach to ASW throughout history was laid down over sixty years ago by one of the most accomplished CNO's in Naval History, Admiral Arleigh Burke.

Chief of Naval Operations Admiral Arleigh Burke initiated "Project Nobska," which carved out a way ahead for the US Navy to deal with ASW against nuclear submarines, as well as focusing on new technologies to defend against them.¹⁰

It is only fitting given his focus that the best class of destroyers ever built were named for "31 Knot" Burke; Burke's standing order in all cases was: "Destroyers to attack on enemy contact WITHOUT ORDERS from the task force commander."¹¹

Admiral Burke summed up his approach in an address written and delivered in 1959:

"The United States is ahead in its ability to use and exploit the sea, in antisubmarine warfare doctrine and capabilities, in the application of naval air power from carriers at sea, in guided missiles at sea.

"These capabilities did not come overnight.

"They are the result of solid thinking and hard work, hours, days, and years of attention to the many jobs the Navy has to do.

"They are the result of cool determination, and the intelligent application of always-limited resources."¹²

The Burke class destroyers and their evolution in the form of the Aegis system embody his thinking and his approach.

According to the US Navy:

"Arleigh Burke Class (DDG 51) Destroyers are warships that provide multi-mission offensive and defensive capabilities. Destroyers can operate independently or as part of carrier strike groups, surface action groups, amphibious ready groups, and underway replenishment groups."¹³

It is past being ironically priceless that President Putin's own news reporting publication *Sputnik News* actually notes the fighting characteristics and combat utility of Burke Class Destroyers, with a very nice picture included.

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According to a 2018 article in *Sputnik News*:

The US Navy has sent invitations to the private sector to submit bids to build Arleigh Burke-class destroyers, the service's top weapons buyer said last week.

Speaking at the WEST 2018 conference last week, James Geurts, assistant secretary of the Navy, said that a new contract lasting from 2018 to 2022 to produce Flight III Arleigh Burke-class vessels was up for grabs. The destroyers will be built either at Bath Iron Works in Maine or the Ingalls shipyard in Mississippi, or perhaps both.

Specifically, the Flight III Arleigh Burke ships feature Raytheon's AN/SPY-6 radar, an active electronically scanned array air and missile defense 3D radar. In advertising the radar on its corporate page of "7 fast facts about the navy's newest radar — and how it will keep the world a safer place," the firm boasts, "it has 'spy' in its name."

Most of the 2017 funding for the Arleigh Burke program went into modeling and designing the vessel to incorporate new radars, USNI News reports.

"The Navy has worked with our industry partners to develop the Flight III testing to ensure each shipyard is well-positioned to execute this [multiyear procurement contract]," Geurts said in an announcement.

The destroyers can carry out a variety of tasks including anti-air warfare, anti-submarine warfare and anti-surface missions.¹⁴

But wait it gets even better.

Dating from our "Ready Now" destroyer's beginning with the fight against German subs in WWI to WWII throughout the Cold War to today destroyers they have always been a huge contributor to Victory At Sea.

In World War I, the US Navy provided destroyers to the conflict against German submarines and their war of attrition against Britain.

Less than 25 years later, the Hunter-Killers of WWII again won the Battle of the Atlantic against German U-Boats.

"In the central and southern Atlantic, F-21 and Tenth Fleet served as the brains while the ships of the Atlantic Fleet provided the brawn for the U.S. Navy's antisubmarine warfare offensive against Axis submarines.

"Smaller sized escort carriers were already sailing near Allied convoys, providing air coverage and thwarting U-boat attacks.

"After 1943, U.S. Navy escort carriers shifted to the offensive. While the British deployed escort carriers with convoys in the North Atlantic, the Americans formed autonomous "hunter-killer" antisubmarine task groups.

"A typical U.S. Navy hunter-killer task group consisted of a number of escort vessels like Destroyers (DD) and Destroyer Escorts (DE), which were centered on an escort carrier (CVE).

"Usually, the hunter-killers would sortie from Hampton Roads to a designated operations area. Afterwards, hunter-killer formations would either return to home port or continue on to alternate ports such as those in North Africa for refits, refueling, and rearmament.

"Maintaining a continuous circuit along the Allied convoy routes and in U-boat operations areas, U.S. Navy hunter-killers were a constant threat to U-boats after 1943."¹⁵

Enter the Cold War as a precursor and prologue to the new age Russian challenges highlighted by President Putin.

Edward R Murrow, who global history has honored as a very serious and honest journalist, made a documentary. Murrow made his point about a naval revolution over six decades ago and it is still extremely important to this day:

“The cold opening of this November 18, 1956 black-and-white episode of Edward R. Murrow’s “See It Now” CBS television documentary series shows the viewer the wheel of the USS Constitution — “Old Ironsides” — the wooden-hulled, three-masted heavy frigate launched in 1797 and the oldest commissioned warship afloat in the world, with the narrator then launching into a discussion of the revered vessel’s history.

“From there, the viewer is shown the wheel of the USS Forrestal (CV-59), a supercarrier, and her sister ship, USS Saratoga (CV-3).

“Currently there is a revolution in the navy.

“A revolution in ships and in weapons and in men.

“A revolution that really began in 1939 when (Albert) Einstein wrote a letter to the President about a new kind of bomb which he predicted would be carried by boats and be capable of enormous destruction.”¹⁶

Put in blunt terms, the weight of history of US Naval operational experience and evolving kill web technology are now to be directed against the threat, which Putin now poses directly against the United States and its guarantees to NATO.

THE SURFACE FLEET, ASW AND DEFEATING HYPERSONIC CRUISE MISSILES: THE CASE OF THE ZUMWALT CLASS

The US Navy and the surface fleet is very much engaged in our strategic and tactical thinking about how to defend against the emerging Hyper-Sonic Cruise Missile threat.

Of course, the best way to stop a HSCM is to sink the enemy sub before it has a chance to fire.

A new player which could play a key role in a kill web approach could be the new Zumwalt class destroyer. There are three ships in this class, but rethinking the key role it could play in a kill web approach to the HSCM and other threats might lead to a rethink.

I have had a lifelong experience with the US Navy first as a “Navy Junior” because my father was career subs and an early participant in the Nuc Sub Navy serving on the USS Triton (SRN-586).

After graduating from Annapolis, I entered the Marines and became a Carrier qualified Naval Aviator so have had a lifetime of experience with the learning cycle for the sea services.

My key take away is that the Navy has proven to be absolutely ruthless in dealing with technology.

The Navy leadership in my personal experience has always been unrelenting on making the very hard choices on giving the best platforms and weapons to their sailors, after having the most open mind of any military in the world on pushing R&D efforts.

Of course, ugly politics often intrude beyond their control in the form of Congressional and OSD meddling. As always in our Constitutional process, one has to respect that civilian control.

Second Line of Defense

But left to their own devices the Navy most often gets it right.

In an article, which I published in [The Washington Times](#) a decade ago, I addressed how the Zumwalt can contribute to the ASW challenge effectively.

The battle in Congress over domestic spending is over and the Republicans lost, but the battle over spending priorities to best defend America is about to begin. Those in uniform have an insatiable appetite for as much funding as possible to fight and defeat any adversary, anyplace, at anytime.

But the president as commander in chief and civilians at the Department of Defense must balance budget needs with demands made by those in uniform to equip, support and train the best combat force in the world.

Unlike mistakes involving domestic spending, which can ultimately be corrected, history shows that errors in defense budgeting, which is confusing, messy and fraught with uncertainty, can bring with them national security threats that often arrive quickly and with unpleasant surprises.

A prime example of this risk - one that will resonate for decades - involves whether to continue building a new class of Navy destroyers named for former chief of naval operations Adm. Elmo Zumwalt.

The Zumwalt-class destroyer was conceived during the Clinton administration as a shallow-water destroyer with sophisticated anti-submarine warfare (ASW) systems. But construction of the first ship didn't begin until February and now, the defense secretary plans to end the Zumwalt program prematurely in favor of modernizing the Burke-class destroyers, a proven class of deep-water warship designed during Ronald Reagan's presidency.

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People can have honest disagreements over which of these two ships to support. But as China expands its submarine capabilities, there's no doubt which American destroyer Chinese sub commanders would rather see scrapped. With superior littoral ASW capabilities designed to detect the quietest electric-powered stealth subs, the Zumwalt-class destroyer is a far greater threat to China's growing submarine fleet.

Perhaps the best guidance for policymakers trying to decide this issue comes from our adversaries - the Chinese. On March 8, five Chinese ships converged on the USNS Impeccable, which was operating in international waters in the South China Sea. The dramatic confrontation was diffused but could have easily turned ugly.

At the time of the incident, the Impeccable was gathering intelligence about 70 miles south of Hainan Island, home to China's newest and most sophisticated submarine base. China is in the process of creating its most lethal and stealthy fleet of submarines. Through an accelerated construction program and by purchasing ultra-quiet Russian subs, the Chinese are working toward a massive naval expansion, which is expected to top 200 attack and ballistic missile subs.

When China went after the Impeccable last month, the Chinese navy (or more accurately their Coast Guard), sent a powerful and very public signal from the waters off Hainan Island that they are worried about the U.S. Navy's antisubmarine capabilities.

Chinese subs leaving port to hide in deep water must be identified and followed as they sortie out from the shallow waters. Now a significant capability of the Zumwalt-class destroyer becomes essential - the ability to defend itself with a significant punch while locating, tracking and identifying Chinese submarines in the cluttered littoral waters off Hainan Island and elsewhere.

Official Navy testimony delivered July 31 pointed out that the Zumwalt-class destroyer is “superior in littoral ASW” to the Burke-class, which has better “blue water” ASW. It the equivalent of a football coach saying the linebacker is superior at the line of scrimmage but the safety is better for deep coverage; both ship classes on the same team are hugely complementary.

Both the Burkes and Zumwalts will have the range and endurance well beyond the capability of the smaller Littoral Combat Ship (LCS). If both are combined in an ASW task force or going together in harm’s way as part of a carrier battle group, they will be mutually supporting and deadly.

Should a Chinese ballistic submarine make a run for open water in times of a building crisis, a future Zumwalt destroyer can tag it in shallow water, follow it to blue water and pass that intelligence along to a Burke destroyer and American attack submarines. This not only keeps America safer, it also keeps American sailors safer.

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If one goes back to my article of 10 years ago and if you simply substitute the Russian sub threat for the Peoples Liberation Army Navy sub threat highlighted in my analysis, the potential role of the Zumwalt is quite clear.

Now with the Russian “gremlin” again on our doorstep, the shallow water ASW capabilities of the Zumwalts might be of considerable value providing a key element in the Atlantic Sea Frontier.

SHAPING A 21ST CENTURY KILL WEB APPROACH TO ASW: LEVERAGING THE S CUBED REVOLUTION

A game changer in weapon effectiveness and a way ahead to deal with a most “wicked problem” facing the US Navy today is how to effectively counter Putin’s threat of using HSCMs, notably aboard submarines.

My preliminary analysis on how to engage with evolving HSCM and to develop counter measures originates from a comment made by the previous CNO Admiral Greenert.

Admiral Greenert graduated from the United States Naval Academy in 1975 with a Bachelor of Science degree in ocean engineering and completed studies in nuclear power for service as a submarine officer.

As a very smart Navy Captain noted in discussing con-ops-“we have no problem using the word attack we are Naval Officers.”

Consequently just like the famous Carrier Pilot mantra “kill the archer not the arrows” in the Navy Air Fight against strike bombers — Sinking the sub at all costs is critical.

But if that isn’t achieved then the Navy then fighting HSCMs in flight is everything.

Thankfully the Navy now has now declared the F-35C carrier version operational. The best way I could hope for in looking at the problem of destroying a HSCM in flight was to identify the coming global “S-Cubed” revolution of Sensors, Stealth and Speed.

“You know that stealth may be over-rated,” Admiral Greenert, the Chief of Naval Operations, noted during a speech at the Office of Naval Research Naval Future Force Science and Technology Expo, Washington D.C. (2015)

Second Line of Defense

“I don’t want to necessarily say that it’s over but let’s face it, if something moves fast through the air and disrupts molecules in the air and puts out heat – I don’t care how cool the engine can be – it’s going to be detectable.”

The CNO was exactly right.

Admiral Jonathan Greenert, a nuclear trained Navy submarine officer, and General Mike Hostage the recently retired Commander of the USAF Air Combat Command and an F-22 pilot are in agreement on the dynamic nature of “stealth.”¹⁸

From General Hostage’s last interview before retirement and one which he did with us:

People focus on stealth as the determining factor or delineator of the fifth generation. It isn’t; it’s fusion.

Fusion is what makes that platform so fundamentally different than anything else.

And that’s why if anybody tries to tell you hey, I got a 4.5 airplane, a 4.8 airplane, don’t believe them.

All that they’re talking about is RCS (Radar Cross Section).

Fusion is the fundamental delineator. And you’re not going to put fusion into a fourth gen airplane because their avionics suites are not set up to be a fused platform.

*And fusion changes how you use the platform.*¹⁹

Just like in Admiral Greenert’s initial warfighting community, the U.S. Navy’s submarines “silent service,” airpower commanders have the same type of relative technology dynamic against a reactive enemy but in a different medium.

Both communities have to be ready to fight in a very dangerous three-dimensional maneuvering environment where active and passive sensing and weapons and countermeasures to those weapons mean the difference between life and death.

In our discussions with Dr. Mark Lewis, former Chief Scientist of the USAF and currently head of the Institute for Defense Analysis Science and Technology Policy Institute, we focused on the threat posed by the hypersonic cruise missile.

We interviewed Dr. Lewis, a leading expert on hypersonics, in the context of rolling out an F-35 fleet with the rapidly approaching Hyper-Sonic Cruise Missile (HSCM) as a new weapon of war.²⁰

HSCMs are part of what one might call an S Cubed formula for thinking about military critical technologies for 21st-century targeted R&D.

S-cubed=sensors-stealth-speed of weapons can provide a new paradigm for shaping a combat force necessary for the US Military to fight and win in 21st century engagements.

Stealth or no stealth the F-35 fits perfectly into the S3 revolution in modern war.

No matter which path is taken, the F-35 as a single platform with all three attributes combined or as a non-stealth sensor platform, employing speed of weapons carried organically or trading off with other platforms at the speed of light by giving incoming target vectors to their weapons.

Airframe design characteristics are all blended together in tradeoffs and have been focused on constantly improving, payload (improved by systems/and weapons carried), maneuverability (measured by P Sub s), speed, and range (modified by VSTOL—a basing mobility plus factor).

Stealth was a clean sheet design for F-22 and F-35 and is embedded in the total airframe and it is a very sensitive multiplicative factor; one does not add stealth.

Additionally like all modern fighters stealth aircraft are also designed with inherent other survivability factors, such as system redundancy and hardening.

Stealth is simply a survivability term that impacts the entire airframe and will eventually decline as better sensors are developed.

This is also why passive sensing is also a real revolution. Passive sensing can attenuate the problem of generating active “signals in space” which often can give away a platform’s position either maneuvering or an absolute fixed location for a counter- attack.

Stealth dynamically over time will become more vulnerable as enemies sensors improve.

How long and against what enemy, and where in world will the ant-stealth sensors and successful weapons be employed is unknown, but it will occur.

Modern air combat, just like submarine warfare is essentially an evolving contest of “blind man’s bluff.”

Even if and when stealth survivability deteriorates—ENTER the F-35 fusion cockpit with passive sensing and a significant payload of hard points.

External weapon hard-points on the F-35 are a brilliant design aspect, which is often overlooked in most discussions.

The non-stealth F-35 can sling more ordinance than F/A-18 and F-16.

So even in a non-stealth world, advantage goes to F-35, with its 360 active and passive horizontally linked cockpit decision-making ability.

As the former CNO says “payloads over performance.”

An F-35 as a non-stealth fleet still has a 360-degree sensor platform with “reach not range” as a fundamental fleet enabler.

It is an information dominance fusion platform that can be favorably compared to the equivalent of being a 21st Century version of USN Destroyers standing very dangerous and heroic radar picket duty protecting the amphibious invasion force and Carrier Fleet against kamikazes off Okinawa.

As the former CNO pointed out “something moves fast through the air and disrupts molecules in the air and puts out heat – I don’t care how cool the engine can be – it’s going to be detectable.”

Only this time against the HSCM and also a lesser-included problem of killing slower cruise missiles if F-35 did not exist it would have to be invented.

In other words, an additional benefit of R&D and con-ops efforts to kill HSCMs makes taking down conventional cruise missiles much easier.

Bluntly put, an overemphasis on sensing of hypersonic missiles from space really misses the point — it is not about being alert to what is about to kill you — it is about killing the archer and the arrow.

Second Line of Defense

And we have in our hands the means to do so as we knit together key platforms which are delivering the S cubed revolution.

The future is now and working enhanced integrative capabilities moving forward with the new platforms and the relevant legacy ones is a core priority; not preparing for a new space world in 2035.

THE ARRIVAL OF THE HSCM: THE ROLE OF THE F-35 IN THE KILL WEB CON-OPS

It is now time to accept that a war-changing weapon, HSCM is in the late stages of R&D and it must be accounted for in any battle plan.

Unlike distant “hyper-sonic” R&D efforts such a Global Strategic Strike aircraft, a hypersonic cruise missile is a rapidly evolving technology, which sooner than later will be demonstrating the art of the possible up close and personal.

Such a revolutionary CM in the US arsenal is a very good thing. In the hands of Russian forces it is a very real “wolf at the door.”

Consequently when, not if, a hypersonic-Cruise Missile is battle ready the Air/Sea Battle staff will have to figure out both offensive and defensive con-ops.

In sufficient numbers a hypersonic cruise missile can be a war-tipping asset.

Employed by US and Allied forces the capability will greatly enable a deadly combat punch.

If it is in the hands of an enemy a hypersonic cruise missile is a ship killer and now a direct strategic threat to the US.

The Cold War USN Carrier Battle Group protection mantra against Russian Bombers with anti-ship cruise missiles was to try and first kill the archer not the arrows.

Top Gun in the late eighties briefed “Chainsaw” tactics, and the F-14 was very well designed for long-range interception of threats against the Fleet.

“Chainsaw” was a focus on reaching out as far a possible against any threats.²¹

Now if Russian and/or PLAAF successfully air launch HSCMs or their missiles are launched from ground batteries or surface ships or subs (USN fast attack subs are of utmost importance in that battle) they will be engaging in their version of the S-3 formula.

Just like the USN and USAF they first need sensors to make it all work.

The order of the “S” words in the priority of formula is very important.

If they develop a HSCM to empower their fighting force the F-35 does not have to fight in the stealth mode against HSCMs.

Even if HSCMs move at Mach 10 an F-35 sensor platform moves “trons” at the speed of light and this can make all the difference.

It is very evident that all fighting forces need both reach and range.

The F-35 today can play both stealth and non-stealth and is a generation better than any other aircraft in the world.

One just has to look at Russian and PLAAF attempts to develop a real F-35 capability and their stealth airframe is lacking the sensor systems comparable to F-35.

It is a pure marketing assertion that they have fusion parity and DAS.

The F-35 “360 Degree Fusion Cockpit” is good for a decade or more as the never ending action/reaction cycle of our enemies attempt to make their technology and training moves to catch up to the United States.

The US and its Allies are the only airpower thinkers and practitioners that can learn TTPs when F-35, F-22 and legacy aircraft mix it all up at a Red Flag. Russian and PLAAF cannot do that training within a decade.

They might claim that they are building fusion cockpits in stealth jets-but currently just by looking at their airframes with no nose sensors or wing sensors, they are simply fusing linear improvements to radar systems. They do not have the complete 360-active/passive reach that the F-35 brings to AA, AG and EW fight.

There is one other significant factor of HSCMs.

A ship has an advantage in that it can maneuver at sea; it also has a distinct disadvantage if a mortal blow is landed it sinks.

In contrast, an airfield or strategic target like the White House or Camp David has a disadvantage in that it they are a very well-known fixed point on land.

TRAINING FOR THE KILL WEB

Both the US Navy and US Air Force have the vision and resources to develop the most modern training ranges in the world and a dedicated unified approach to collecting operational intelligence against HSCM airborne “signatures.”

During a visit to Nellis AFB Major General Jay Silveria, then the Commander of the USAF Warfare Center, pointed out that one of the missions of his command is to create a mission file for the F-35 fleet.

“The mission file includes all of the data about every threat, aircraft, surface-to-air missile, blue aircraft, and airliner, whatever that airplane may see during its flights.

“That intel mission data will fill the mission data file that will build is what the airplane then goes in and looks to see when it fuses that target.

“The mission data file that we’re building right now in the 513th at the 53rd wing which are part of the Warfare Center were initially building are for the Marines.”²²

The value is that USAF, USMC, USN and Allis have the possibility of working off that same mission data library.

The very practical application and perhaps battle tipping aspect of a fleet wide mission data file is that if just one F-35 anywhere anytime gets hit on a HSCM, the entire fleet can have the data.

This is unique capability to be able to prevail in modern war.

Concurrently, the Navy at Fallon is also building a significant training complex for practicing current con-ops and looking forward to studying how to defeat future threats.

Second Line of Defense

Rear Admiral Scott Conn was Commander of Naval Strike and Air Warfare Center during our visit in 2014. He is now head of Naval Aviation at N-98.²³

According to Admiral Conn, “We are working at Fallon at expanding the capability for Naval aviation to operate in an expanded battlespace.”

And the Admiral made it clear that this was being done with adding capabilities like the F-35, and leveraging joint and coalition capabilities into what we are calling an attack and defense enterprise.

He and his team are spearheading a broad based effort to expand the envelope of training to combine live and virtual training by building a Live, Virtual, Constructive (LVC) training range as well, an approach well under progress at Fallon.

Rear Admiral Michael Manazir, when he was Director of Naval Air Warfare identified the Navy way ahead that will allow tactical innovation and practices for the best way to attack and destroy incoming HSCMs.²⁴

The threat baseline that we’re looking to fight in the mid-2020s and beyond is so much more advanced that we cannot replicate it using live assets. And those advances are in the aircraft capability, the weapon capability, and in the electronic warfare capability of the threat systems.

That drives us to thinking about a different way to train.

Live, virtual, constructive (LVC) training is a way to put together a representation of the threat baseline where you can train to the very high end using your fifth generation capability.

Some of it is live with a kid in the cockpit, some of it is virtual in a simulator, and so “virtual” is actually the simulator environment.

And then constructive is a way to use computers to generate a scenario displayed on either or both of the live or simulated cockpit.

You can also combine them to be live-constructive, or virtual-constructive, and by that I mean there are systems out there right now that you can install in the airplane that will give you a constructive radar picture air-to-air and surface-to-air along with the electronics effects right onto your scope.

You’re literally flying your airplane, and through a data link, you can share that information between airplanes, you can share it between dissimilar airplanes.

Thus a key way ahead for R&D and con-ops to deal with the coming HSCM threat is clear.

The F-35 does not have to be in a stealth mode to sense and engage against HSCM racing at a CSG—it can go out and loiter as a 360-sensor picket platform and can empower the kill web with its detection capabilities.

SHAPING A WAY AHEAD TO DEAL WITH HSCMS

My initial 2011 paper “winning Air/Sea Battle” only looked at F-35 as early warning platform.

Essentially, I focused in that paper on the F-35s as providing a “heads up” to fleet surface ships about “incoming” missiles threats but in the non-stealth mode the F-35 can carry more ordinance than F/A-18 or F-16.

So instead of just a “heads-up” to the NORTHCOM/NORAD Commander or an Admiral commanding a Carrier Strike Group to make ready American shore defenses or a fleet for close in defensive measures, why can’t an F-35 carry anti-HSCM designed ordinance to kill HSCMs in flight?

Design a missile that can link to the fusion cockpit for an immediate fire control solution and launch a missile with an appropriate warhead to take down an incoming HSCM.

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In an email exchange with Dr. Lewis, he raised a significant challenge which needs to be addressed in R and D and the shaping of effective con-ops.

“The biggest threat I see is actually a swarm attack of high-speed incoming, that might overwhelm any solution. The Chinese have been rather open about this tactic.”

“It is very fair to say it is truly a wicked problem, but he also adds; “the good news is there are indeed solutions that will stop them.”

“The one point in favor of the HSCM intercept to a kill shot is the need to just get in front of the missile with something that abruptly and directly disrupts its forward motion.

“The key to defeating it is to make it beat itself to death— the old joke about you only have to be close in horseshoes and hand grenades applies.”

Again quoting Dr. Mark Lewis from that email exchange:

“One method of stopping them simple kinetic will be effective, with the challenge that a high-speed maneuvering missile will be rather hard to catch with dumb ordnance.

“And with a rapid closing speed, the window for that kill chain is of course small.

“There are other very promising options as well.

“Stability and control of a hypersonic craft is a key element. The DARPA HTV-2 failed twice due to control losses, something that the Air Force warned DARPA about ahead of time.

“In the case of HTV-2 flight 1, the loss occurred due to yaw-roll coupling; essentially, the vehicle developed a small asymmetry, began to yaw, and corrective control action caused it to roll out of limit.

“That was a case of bad design, but also an example of how easy it is to mess with these craft.

“HTV-2’s second flight was lost because an important protection system failed again making it uncontrollable.

“I can’t help drawing an analogy to the old German V-1’s, that could be disabled by flying alongside in a fighter and hitting their wing tips. The resulting roll made them unstable!

“The third flight of X-51, where a fin broke off the cruise vehicle during solid rocket boost, and when it separated from the solid motor (at Mach 4.8) it almost immediately lost control. So when you are flying at hypersonic (or even supersonic speeds) and take even minor damage, survival is unlikely.

“Coincidentally, and as a funny historical quirk, there is a pretty long list of hypersonic programs that have been lost due to fin failures completely unrelated to the hypersonic portion of the flight: X-43 first flight, the Australian HyShot first flight, and now most recently, AHW’s second flight.

“That last one is especially painful; the booster lost a fin a few inches above the launch pad due to an entangled thermal blanket.

A hypersonic missile must travel between Mach 5 and Mach 10, or 3,840–7,680 miles per hour in order to be considered hypersonic.

One should think a mile a second.

By comparison, a current missile AA missile, the AIM-120 has the characteristics seen in the graphic below (credit Wiki).

Second Line of Defense

Wingspan	20.7 inches (530 mm) (AIM-120A/B)
Operational range	<ul style="list-style-type: none">• AIM-120A/B: 55–75 km(30–40 nmi)[3][4]• AIM-120C-5: >105 km(>57 nmi)[5]• AIM-120D (C-8): >180 km(>97 nmi)[6]
Speed	Mach 4 (4,900 km/h; 3,045 mph; 1.3612 km/s)
Guidance system	inertial guidance, terminal active radar homing

Thus, there is a speed differential of between 1 and 6 Mach and also the HSCMs are also in flight, the intercept missiles are at a standing start.

The first look at intercepting a HSCM inbound against the fleet is one of the first verbal math problem we all had in Algebra 1-“A train leaves a station going 50 mph... Another train leaves it’s station going 80 mph.. etc etc.”

The logic of that example is that both HSCM and intercept missile are on the “same track” and a parallel track for a perfect “face-shot.”

However, the crossing angle to intercept may be much more significant, say for example an F-35 flying on a heading of 090 and the pilot’s cockpit’s fusion display picks up a HSCM coming at the Fleet heading 180 and the closes point of approach for the physical passing of the F-35 on station and HSCM for intercept is offset by say 30 miles and at a different altitude.

The F-35 sensor shooter for an example could be 90 degrees off the nose for an intercept vector and also off set by some miles and altitude from the physical closes point of approach, this is a very hard shot.

The F-35 at best can try to point and shoot with the missile arming and independently maneuvering but having been initially launched many degrees off the aircraft’s initial route of flight.

The challenge is that at some point in space and time, the kill missile must get in front of the HSCM.

It is not necessary to hit a bullet with a bullet.

With the current significant Mach differential shown above a conventional missile cannot run down a HSCM.

With focused R&D perhaps a future hypersonic-interceptor missile is possible but in this example I am using the current art of the possible and assuming a +6 Mach advantage given to the HSCM and it is already in flight while interceptor missile is on the rail at the start.

Therefore, detection and reaction time for launch and missile light-off the intercept angle for the missile altitude differential make time and distance of flight against HSCM everything.

At around 88 miles per minute incoming, depending on altitude it is a very hard problem.

The first issue is simply just getting a missile off an F-35 in the time of calculation for sensing something approaching at a high rate of speed.

Using the CNO’s formula heat=sensing, an F-35 can see something moving very fast at a distance.

How far away is one key BUT not a showstopper.

Second Line of Defense

Because if the F-35 can sense at a whatever distance it is reacting electronically at the speed of light and there is the possibility of doing something about it.

Slaving an immediate launch fire-control solution from the F-35 fusion cockpit sensed HSCM route of flight vector to an interceptor missile loaded on the aircraft hardpoints is one way.

But just as significant the F-35 sensor can off load the kill shot to another F-35 with a better chance.

To have any chance of success the launching F-35 has to have a certain head on aspect – if the HSCM is beyond the wing-line the engagement is lost at first detection.

The kill-shot game for that one F-35 in launching a counter-missile is already be over.

But now think of a 21st Century “chainsaw” as a solution set and a way ahead.

The USN strike commander is currently using F/A-18s to refuel F/A-18s. Since stealth is not an issue against an HSCM swarming missile attack, a mix of F-35s with F/A-18 tanking assets can put as many F-35s on a combat air patrol station as far away from the surface fleet as possible for early detection. That effort can then feed-back for defense in depth combat engagements.

Against even a Mach 10 threat the F-35 data linked information dominance sensor can off load at the speed of light the incoming track of swarming inbound HSCM threats to other F-35s standing CAP right over the Fleet.

Additionally, all USN combat platforms can also light up; AEGIS ships, Growlers, E-2 Hawkeyes and other close in defensive combat weapon systems.

Also, the Ford CVN-78 has been specifically designed with an area on the flight deck to configure the air wing aircraft quickly and efficiently with the appropriate ordinance for the appropriate mission.

In alternating between offensive strikes, using active or passive stealth with weapons in a weapons bay or non-stealth with a significant weapons load, the combat ordinance on an F-35 can be configured quickly.

As the combat situation dictates the defensive requirements of loading anti-HSCM missiles as stated above can also be done quickly. USN ship design teams working on the CVN-78 figured this all out; switching ordinance and/or reloading.

It is no small issue; the Japanese carriers were sunk at the battle of Midway because they were caught in an arming, de-arming, arming cycle. From that moment forward they were going to lose the war.

The challenge for the R&D community is to immediately give a lot of thought and research on what type of ordinance, missiles and warheads are best to defeat a HSCM.

The challenge for strategic planning is to consider a return “back to the future” and establishing an East Coast Air Defense string of bases for the F-35A/B/C.

F-35 wide area sensing targeting and mapping capability against, air -breathing HSCM, enemy aircraft and surface ships is beyond excellent.

They can fulfill the target acquisition requirement of a Payload Utility function.²⁵

“The difference between a good and great officer is about ten seconds”. Admiral Burke.

The US Navy now has many great officers moving in the air at sea and under the ocean surface at light speed sensing acting and if necessary killing.

Second Line of Defense

It is not just about getting better intelligence through space-based systems to have an historical record of what killed you. It is about the kill web executing the kill function.

If F-35s are stationed to stand air defense alert in a 21st Century “Cold War basing” con-ops from Otis ANG Base to NAS Pax River, (or Quantico air field) Langley field, NAS Oceana, MCAS Beaufort and NAS Key West (Bocha Chica) then appropriately networked to other “kill shot” platforms both at sea and Army ADA we might survive an attempted first strike.

If Putin and the Russian military saw this type of preparedness they might always hesitate.

Even if a Russian cruise missile sub gets off a shot it is dead dead, dead because the F-35, P-8 and Triton will know exactly where it is on launch and can deliver an effective payload for its defeat and provide other options as well.

THE FUTURE IS NOW: THE US NAVY, THE KILL WEB AND DEALING WITH PUTIN’S CHALLENGE

President Putin has just given all in America a wakeup call, but to the Russian Military everlasting regret if combat ever breaks out the US Navy is always ready-NOW.

Over fifty years ago, 1965, in Bancroft Hall at the United States Naval Academy, Plebes (freshmen) were required when making a very loud announcement to a gathering of fellow Midshipman to begin with the alert-“attention world, attention world.”

It was a time at Annapolis when some of those who had fought WWII in the great “Big Blue Blanket” war winning con-ops were still in uniform, several of the Navy Pilots who were featured in the great work “the Bridges of Toko-Ri” were still in uniform, and Vietnam Yankee and Dixie station Carriers were beginning to fight that war.

From Plebe to Four Star Admirals, all in the United States Navy and Marine Corps were constantly engaged and challenged in understanding and mastering the dynamic nature of war at sea and the role of Navy/Marine power projection from across the beach.

In those days sailors still in uniform wearing the Dolphins of the “silent service,” the Navy Submarine Community, would proudly point out that with the loss of 52 subs “still on patrol” that their community sunk over 50% of the tonnage of the Imperial Japanese Navy in WWII.

All Navy commanders have to practice over and over to evolve a much broader scope of understanding and direction in this 21st Century information world.

It is a 21st Century challenge to understand the dynamic learning from a computer-human interface while also recognizing it is the goal of a reactive enemy to attempt to destroy not only individual platforms, sink ships and subs and shoot down aircraft, but wreck the very synapses of all things command and control.

Information assurance with redundancy and reliability is critical but also the ability to act independently as systems are degraded to fight and win cannot be forgotten in all training exercises.

The enemy always gets a vote but so does the United States Navy.

The decade ahead is not a repeat of the past 15 years; it is not about a continuation of the land-centric and counter-insurgency slow motion war.

ASW platforms which can operate in an interconnected manner are the crucial ones to build, deploy and sustain in the period ahead, versus those which are very limited in their capability to provide synergy to joint or coalition forces in the battle space.

This means as well that force packages need to be examined, less in and of themselves terms, than in terms of their synergy and capabilities in shaping dominant combat power in the interconnected battle space.

In a lasting reminder to anyone who threatens America from the sea there is a monument at the sea wall at the US Naval Academy, of those “Still on Patrol,” the names of lost Submarines from a fading war that are ever within the ethos of the fighting courage of sailors in today’s Silent Service.

Courage does run deep.

Bluntly put, an overemphasis on sensing of hypersonic missiles from space really misses the point — it is not about being alert to what is about to kill you — it is about killing the archer and the arrow.

And we have in our hands the means to do so as we knit together key platforms which are delivering the S cubed revolution.

The future is now and working enhanced integrative capabilities moving forward with the new platforms and the relevant legacy ones is a core priority; not preparing for a new space world in 2035.

¹ “Russian President Vladimir Putin has threatened to target the U.S. with nuclear-tipped missiles capable of quickly striking the continental United States.”

<https://www.popularmechanics.com/military/weapons/a26431348/russia-putin-inf-treaty-new-nukes/>).

² Bracken, Paul. *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (p. 41). Henry Holt and Co.. Kindle Edition.

³ <https://slidinfo.com/2013/01/the-challenge-of-deterrence-in-the-second-nuclear-age-a-discussion-with-paul-bracken/>

⁴ Marsha Gessen, *Putin Lied About His Nuclear Doctrine and Promised Russians That They Would Go to Heaven*,” *The New Yorker* (October 19, 2018).

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- ⁶ <https://news.usni.org/2016/10/03/cno-richardson-navy-shelving-a2ad-acronym>
- ⁷ <https://breakingdefense.com/2016/04/northcom-defending-north-america-at-ten-and-two-oclock/>
- ⁸ <https://sldinfo.com/2017/08/nawdc-and-shaping-a-21st-century-combat-force-the-perspective-of-admiral-hyfi-harris/>
- ⁹ <https://sldinfo.com/2017/09/the-maritime-services-and-the-kill-web/>
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- ¹⁴ <https://sputniknews.com/military/201802121061593701-us-navy-guided-missile-destroyer/>
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- ¹⁸ <https://sldinfo.com/2015/02/shaping-an-s-cubed-combat-revolution-preparing-for-the-coming-hypersonic-cruise-missile-threat/>
- ¹⁹ <https://breakingdefense.com/2014/10/accs-gen-hostage-on-fifth-gen-combat-cloud-and-syria/>
- ²⁰ <https://sldinfo.com/2013/04/a-leap-ahead-in-the-weapons-revolution-the-coming-of-the-hypersonic-cruise-missile/>
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- ²³ <https://sldinfo.com/2014/11/training-for-the-extended-battlespace-an-interview-with-rear-admiral-scott-conn-commander-naval-strike-and-air-warfare-center/>
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