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Does the Tail Wag the Dog? Mission Command, Technology, and C2 in the U.S. Navy

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In a white paper published in 2012, General Martin E. Dempsey, Chairman of the Joint Chiefs of Staff, established Mission Command as a central tenet of future military operations in an uncertain environment.[1] With an emphasis on decentralized execution, disciplined initiative, and independent and aggressive actions from subordinate commanders, General Dempsey believes that Mission Command will best position the U.S. military to conduct operations in a chaotic and rapidly changing operating environment.[2] Much of the Joint Force 2020 charged with adopting Mission Command is accurately characterized as having been "shaped by a decade of lessons learned in war."[3]

However, neither Operation Iraqi Freedom nor Enduring Freedom presented the U.S. Navy with major opposition at sea. Furthermore, communications and data networks that facilitate centralized control have proliferated throughout the fleet. Historical analysis of the Command and Control (C2) organizations of western navies suggests a link between advances in communication technologies and an initial tendency to centralize C2, resulting in a loss of initiative and combat effectiveness. Some may

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argue that the technological advancements of the Information Age have made centralized C2 an appropriate and effective framework for naval operations. However, the U.S. Navy's success in future major combat operations may well be determined by its ability to reject centralized C2, establish tenets of Mission Command as official doctrine, and train toward its employment.

Choices and Limitations: Mission Command on Land and at Sea

To understand the future of Mission Command in the maritime domain, it is important to first understand its genesis on land. Mission Command was codified after the crushing military defeat of Prussian forces by Napoleon during the Battle of Jena in 1806.[4] Recognizing the inherent limitations of rigid command and control, the Prussian military developed *Auftragstaktik*, or "mission type tactics."[5] *Auftragstaktik* linked the subordinate's tactical initiative towards the commander's operational end and eventually defined the culture of the Prussian and German militaries.[6] The fog of war became an accepted constant, best countered and exploited by the tactical initiative of the subordinate commander positioned to assess the situation. As a result, advances in communications facilitated *Auftragstaktik* during German combat operations in the Second World War.[7] The "why" and "when" of a mission order could now be relayed over greater distances via wireless communications. The "how" remained the purview of the subordinate. That *Auftragstaktik* was a doctrinal choice, shaped in part by the identified failure or limitations of a centralized C2 model, may echo the United States' adoption of Mission Command today.

In contrast, Mission Command in the maritime domain developed through the negation of a viable alternative. Early naval commanders did not possess the technical capabilities to convey orders to subordinates beyond visual range, forcing them to rely on the subordinate's judgment and initiative. Until the invention of the wireless telegraph in the early 1900s, a ship conducting independent operations could potentially operate for weeks, if not months, without receiving direction from a senior commander.[8] While this initiative based approach to tactical execution should logically translate to greater autonomy during major fleet actions, the history of communications advancements at sea and the character of navies as technologically driven organizations often proved otherwise.[9]

Better C2 Through Technology? British Centralization and Nelson's Rebuttal

Early communications technologies, such as the British Navy's development of codified visual signals that conveyed specific tactical orders, indicate that communications advancements have often had a shaping effect on naval C2 organization vice an adaptive one. Rather than determining how these advancements could facilitate existing tactics, enhanced communications changed the British Navy's C2 organization. Following the Seven Years War, the British admiralty adopted the signals books of their hated (and recently defeated) French enemy and developed a "state of the art signaling system [that] offered the comfortable prospect of centralized control from the quarter-deck of the flagship."[10] Centralized control became widely adapted and remained the hallmark of British and French naval actions throughout the late 1700s in fleet actions near the American colonies, the Caribbean, and the Indian Ocean.[11]

Even while centralized C2 possessed numerous proponents throughout both the French and British fleets, one of its principal dissenters led the British to the most lopsided and decisive victories in the age of sail. Lord Admiral Nelson's embrace of decentralized C2 was likely borne of a naval engagement off the coast of Cape St. Vincent, Portugal.[12] Throughout the course of the battle, Nelson repeatedly ignored the signal orders of his commander in light of his interpretation of the best course of action to defeat the Spanish fleet.[13] Nelson would later put his telescope to his blind eye in action against the Dutch after receiving an order to leave off action, saying, "Damn the signal. Keep mine for close battle flying. That's the way I answer such signals! Nail mine to the mast!"[14] During both engagements, his refusal to follow orders that did not accurately reflect the tactical situation proved critical to British victory.[15] While these actions, in and of themselves, could be dismissed as simple insubordination, they were aligned with his commander's intent. Had he disregarded his commander's orders and failed, he would have likely ended his naval career in disgrace. His victories, during both engagements, instead shaped Nelson's decision to decentralize C2 while in command of fleet actions at the Nile and Trafalgar.

Like the Prussian fathers of *Auftragstaktik*, Nelson adopted decentralized C2 at the Nile and Trafalgar after experiencing the failures of the alternative. At both Cape St. Vincent and off of Copenhagen, British commanders issued orders that did not accurately reflect the tactical situations of their subordinates. If Nelson attributed the fleet's failure to achieve a decisive victory in either engagement to the individual senior commanders, he would have likely pursued the same model of centralized C2 once in operational command. Rather, he faulted the model itself and developed trusted subordinates capable of understanding and executing his intentions in battle.[16] At Trafalgar, he would transmit a solitary maneuvering command via signal; his transmission to "engage the enemy more closely" was more flourish than actual command.[17]

Moreover, his understanding of the benefits of decentralized control allowed him to develop a revolutionary plan for the conduct of the engagement. Rather than arrange his fleet into a conventional line that would sail in parallel with the enemy, trading broadsides and seeking an advantage in the weather gauge, Nelson broke his line into three separate elements and relied upon the initiative and independent actions of his subordinates to achieve a decisive result.[18] The "Nelson Touch" was a product of his acceptance of chaos as a wartime constant that could not be mitigated by technology but could be exploited through decentralized C2.[19]

"Going to sea used to be fun, and then they gave us radios." (Admiral Arleigh Burke)

Unfortunately, the "Nelson Touch" did not endure in practice for either the British or American fleets in the face of communications advancement. By the early 1900s, the effectiveness of the wireless telegraph in the maritime domain was validated by its contributions to the Japanese victory over the ill-trained Russian fleet at Tsushima Straits, where it was used to pass tactical directions and relay the Russian fleet's position.[20] Its ability to also function as a paralytic to individual initiative was evident during the British fleet's actions at Jutland during the First World War. With over 100 surface vessels to command, the wireless telegraph provided Admiral Jellicoe, Commander-in-Chief of the British Grand Fleet, with a mechanism for centralized control that would have been impossible prior to its

incorporation.[21] Accordingly, individual initiative and aggressiveness from subordinate commanders declined "for fears their superiors knew something they did not (or had intentions for which they were unaware)."[22] The Grand Fleet failed to achieve victory against the German Navy in large part because the British admiralty allowed emergent communications technology to determine their C2 organization and operational philosophy, rather than treating the wireless telegraph as an additive technology toward Mission Command.

The role of communications advances towards centralizing C2 in the British fleet continued into the Second World War. In one particularly egregious example of technology facilitating centralized C2, the British Admiralty ordered a convoy to scatter due to intelligence indications that the German battleship *Tirpitz* would sail against the convoy.[23] The escort commander possessed the on scene situational awareness and argued that clear skies in the local area would prevent the German's from exposing the *Tirpitz* to aerial attack.[24] The Admiralty, however, possessed the decision-making authority in a centralized C2 organization. The convoy was scattered and subsequently slaughtered by submarines. The *Tirpitz* did not sail.[25]

The U.S. Navy's experiences in the early stages of the Second World War demonstrated similar problems with centralized command. An After Action Report (AAR) of the Battle of Guadalcanal performed by W.S Pye, former President of the Naval War College, detailed the attempts by the Officer in Tactical Command (OTC) of Task Group (TG) 67.4 to maintain control of the assembled TG through a flurry of radio commands during a fleet on fleet action.[26] The OTC's issuance of multiple maneuvering and firing commands in quick succession effectively splintered his fleet, reduced their striking power, and contributed to incidents of fratricide.[27]

The Commander-in-Chief of the Pacific Fleet, Admiral Chester Nimitz, would commit the same sins of micro-management on a grander scale during Admiral Halsey's raid on the Marshall Islands.[28] Without any direct knowledge of the course of the engagement, Nimitz directed Halsey to "exploit the situation," and "expand his operations."[29] While Halsey chose to ignore those orders, it is likely that other subordinate commanders would have followed them and exposed the depleted U.S. carrier fleet to unacceptable risk for a limited gain.

Nimitz' actions and the C2 failures of TG 67.4 were neither an aberration nor unpredictable. Instead, they were the inevitable by products of the U.S. Navy's cultural failures preceding the Second World War. The tendency to micro-manage subordinate commanders, facilitated by over the horizon communications technology, had come to dominate the service. In an admonishing message sent on January 21st, 1941, Admiral Ernest King, Commander in Chief, Atlantic Fleet, addressed the over-centralization of C2 throughout the Navy, stating,

I have been concerned for many years over the increasing tendency - now grown almost to 'standard practice' – of flag officers and other group commanders to issue orders and instructions in which their subordinates are told 'how' as well as 'what' to do to such an extent and on such detail that the 'Custom' of the service' has virtually become the antithesis of that essential element of command – 'initiative of the subordinate'…We are preparing for...those active operations (commonly called war)

which require the exercise and utilization of the full powers and the capabilities of every officer in command status. There will be neither time nor opportunity to do more than prescribe the several tasks of the several subordinates…expecting and requiring of them – the capacity to perform the assigned tasks.[30]

King, who would serve as the Chief of Naval Operations during the Second World War, understood that Mission Command was an essential cultural philosophy and doctrine for successful combat operations. Additionally, creating a force capable of executing Mission Command in war required a significant investment in training and the willingness to accept additional risk at the tactical level of war to achieve operational ends.

Had U.S. Navy forces at Leyte Gulf failed to embrace Mission Command, it is unlikely that it would have achieved victory in the last major surface engagement of the war. Success during the Battle of Surigao Strait depended on the ability of subordinate commanders to aggregate their tactical decisions towards an operational end. Admiral Jesse Oldendorf, left to cover the Japanese fleet's approach to Leyte, possessed a makeshift Allied fleet comprised of over 40 major surface combatants, 39 torpedo boats, and 2 scout submarines.[31] The submarines, *USS Darter* and *USS Dace*, independently made the decision to delay their attacks against the Japanese to report the position and composition of the enemy fleet.[32] Furthermore, the commander of Destroyer Squadron 54, Captain J.G. Coward, coordinated his plan of attack with Oldendorf, despite not being under his command: "At 1950 October 24 he sent 'Oley' this message: 'In case of surface contact to the southward I plan to make an immediate torpedo attack and then retire to clear you. With your approval I will submit plan shortly.' Fifteen minutes later, Oldendorf radioed his approval. At 2008, Captain Coward sent the Admiral his basic plan, details to follow shortly. Coward did not merely volunteer; he announced that he was going in."[33] Coward's actions are only one example of the displayed initiative and decentralized decision-making and execution that was the hallmark of the U.S. Navy's fleet employment at Surigao Strait. Senior commanders used communications technologies to establish their intentions and subordinate commanders understood their operational objective and coordinated their tactical actions towards that end.

The decentralized C2 organization used by the U.S. Navy in its victory at Surigao Strait resulted from its informal adoption throughout the fleet throughout the war. The "intelligent initiative displayed" by subordinates characterized the U.S. Navy's operations in the Gilbert Islands and was noted as a redeeming feature of the long naval campaign of Guadalcanal.[34] However, by November 1944, the U.S. Navy's tacit adoption of Mission Command was formalized in the War Instructions provided to the fleet.[35] Specific provisions emphasized the senior commander's responsibility to ensure subordinate commanders understood his intent, a subordinate commander's responsibility to deviate from orders to better meet the senior commander's intent, and the value of initiative.[36] The U.S. Navy's communications capabilities had not changed significantly throughout the war; its understanding of centralized C2's inherent limitations in a dynamic battle-space had.

Seeing Through the Fog: Establishing the Common Tactical Picture

Centralized C2 models failed in the past because advances in communications offered an incomplete solution to a complex problem; how can a commander both communicate and see through the fog of war? Our historical decentralized C2 models valued the proximity of the subordinate toward understanding the tactical problem, primarily because there was no way to adequately expand that understanding into a common tactical picture readily available to the senior commander. However, attempts to fuse data from individual platforms and sensors into a consolidated picture have shaped the past several decades of the U.S. Navy's technological development.[37]

Efforts to establish a distributed network of sensors aimed toward providing a naval commander with an accurate tactical picture were first undertaken by the British Royal Navy in the early 1900s.[38] Admiral Sir John Fisher placed intelligence agents in various foreign ports and intercepted the sailing orders of enemy fleets in order to plot and track the location of enemy fleets.[39] By determining a rudimentary tactical picture of the enemy, the British fleet could concentrate and steam along a vector likely to result in a decisive battle.

Plotting the position of friendly and enemy forces later shaped naval engagements during the First and Second World Wars, though significant technological problems limited their effectiveness. Radio limitations and the varying availability and quality of radar sets preserved the chaotic nature of naval engagements, particularly when fought at night or in mass.[40] Consequently, the ability to ensure an accurate plot of friendly and enemy forces typically ended at the start of the engagement.

The high cost of the U.S. Navy's actions against the Japanese at Guadalcanal, while attributed to the inherent limitations of centralized C2, actually resulted from the U.S. commander's failure to understand the impact of technology on C2. Prior to the night battle of 11 and 12 November, Rear Admiral Daniel Callaghan failed to shift his flag from the USS San Francisco to the USS Helena, which possessed advanced surface-search radar.[41] The surface picture attained by the Helena during the battle thus could not quickly translate into a coherent tactical picture for Callaghan, but required transmission to the bridge of the San Francisco before its final incorporation into Callaghan's flag plot.[42] As a result, time delays degraded the accuracy of the tactical picture and contributed to a series of poor tactical decisions that resulted in both fratricide and unnecessary losses.[43]

Callaghan's failure was not the result of his decision to centralize C2 but to do so from the San Francisco. Helena's radar provided him with the ability to build a tactical picture previously available only through proximity. He possessed the technological capability to cut through the fog of war, and simply failed to use it properly.

No Longer Choice, But Necessity

Although Callaghan did not understand how technology offered commanders an equivalent to proximity, the U.S. Navy's focus on over the horizon communications, networked detection, and targeting systems in the modern era suggests that its modern leaders clearly do. In 1979, Chief of Naval Operations (CNO) Admiral Thomas Hayward led the Navy's early efforts toward developing an integrated and largely automated tactical picture through data networking.[44] After experiencing significant growing pains throughout the 1980s, surface fleets and aircraft now possess a common

tactical picture that provides a senior commander with the ability to execute centralized C2 over a vast array of widely distributed surface, subsurface, and air platforms.[45] Furthermore, if technological advances in data networking provide commanders with the capability to centralize C2, the weapons and platforms of modern naval warfare employed by, or against, a peer competitor provide the necessity to do so. The Chinese Luzhou class destroyer's C-802 has an effective range of 65 nautical miles.[46] In contrast, the most capable surface-to-surface weapon fielded by the Imperial Japanese Navy, the Type 93 Long Lance torpedo, had a maximum range of less than 19 miles.[47] When considered in concert with a near peer competitor's ability to conduct naval operations in multiple domains (surface, air, subsurface, and cyber), the increased range and lethality of naval weapons require a centralized C2 model to effectively aggregate the actions of individual vessels in both attack and defense towards an operational end.

The U.S. Navy's current Composite Warfare Commander (CWC) model reflects that need to mass effects and efforts through centralized control. While Naval Warfare Publication 3-56, the governing document for the CWC concept, praises decentralized command, the CWC model is best understood as a framework for layered centralized control.[48]

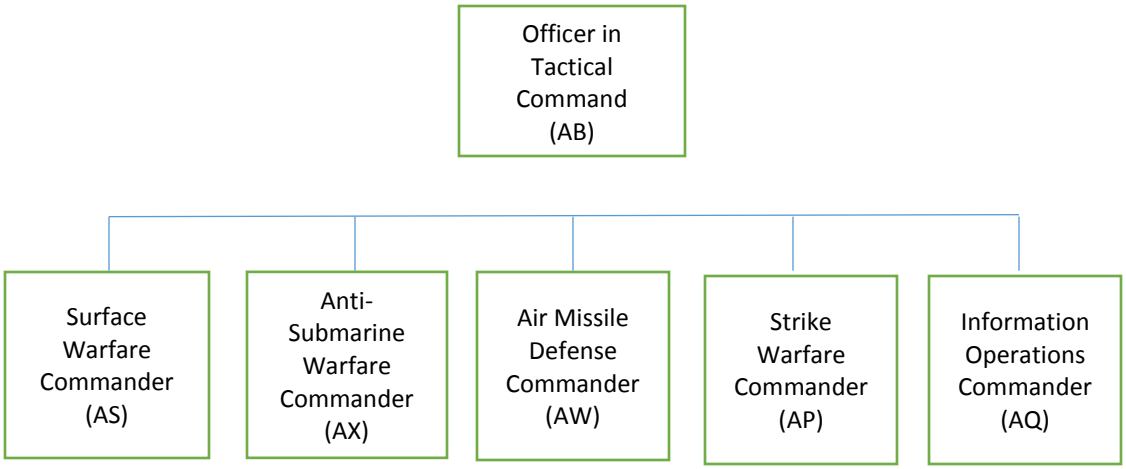

Figure 1 Derived from NWP 3-56

The Officer in Tactical Command exerts overall command over the assets in his or her battle group or surface action group, with Composite Commanders executing control over various assets as dictated by asset capabilities and the tactical situation.[49] For example, an AEGIS- equipped cruiser may act in support of the Surface Warfare Commander, Strike Warfare Commander, or Air Missile Defense Commander, either sequentially or simultaneously, during the course of a sea engagement. That same cruiser, however, requires specific authorization from a Composite Commander to either initiate action or deploy weapons and sensors.[50] This preservation of centralized control within the CWC model prevents redundancy in targeting and defensive actions, or the inadvertent escalation of a conflict.

The CWC model provides both the OTC and Composite Commanders with the necessary framework to exploit the advantages conferred by several centuries of communications advances and multiple decades of advances in computer networking. Furthermore, the centralization of control

present within the CWC model provides an effective method for coordinating naval actions across multiple domains. Having overcome the technological limitations that prevented previous attempts to execute centralized C2 in naval combat, the U.S. Navy should not carelessly abandon a functional model in favor of decentralization.

While the range and capabilities of the U.S. Navy's weapons and sensors have improved significantly during the past several decades, the size of the fleet has declined precipitously. In 1980, the U.S. Navy possessed 191 surface combatants.[51] By 2007, that number fell to 115 and the Navy possessed the fewest number of total vessels (to include submarines and auxiliaries) in its history since the start of the First World War.[52] If the U.S. Navy faces a near-peer competitor with its reduced fleet, efforts to establish sea control will likely be heavily synchronized across platforms and domains to achieve any chance at success.

The decision to centralize control throughout the U.S. Navy's fleet operations will only become more likely as communications and weapons technologies advance. As both the range and lethality of naval weapons improve, the risk of inadvertent major conflict increases if they are not tightly controlled. During the Cold War, the U.S. Navy pursued increasingly centralized C2 to avoid sparking a nuclear exchange.[53] A similar course of action may prove necessary to avoid an inadvertent war with a rising China.

Kill TV, Satellites, and Tactical Admirals

Although technology provides commanders with a means for centralizing C2, the decision to centralize or decentralize C2 and to what degree to do so is ultimately the commander's. Accordingly, that decision should be shaped from a thorough understanding of both the operating environment and strategic, operational, and tactical objectives. Additionally, commanders need to understand the limitations and vulnerabilities of the technologies that enable centralized control. Finally, commanders must understand the longrange implications of centralized C2 on the development of future operational commanders.

The networks and space-based technologies that provide U.S. Navy commanders with the ability to centralize C2 are vulnerable to attack and will likely be high-priority targets for China in potential future combat operations.[54] Accordingly, the fleet's ability to network data for force disposition, detection, and targeting is both a critical strength and a critical vulnerability. If centralized control is rigidly enforced throughout the fleet, the successful disruption or destruction of Low Earth Orbit (LEO) satellites and computer networks by the People's Liberation Army (PLA) may severely limit the U.S. fleet's combat effectiveness.[55]

Yet even if the U.S. Navy constructed a network architecture that was impervious to attack, the second and third-order effects of rigid centralization should be considered. Technological innovations coupled with a lack of trust in the judgment of subordinates can invert the commander's role in war, leading to what Peter W. Singer, director of the Center for 21st Century Security and Intelligence, has coined as the rise of "the tactical general": "The four-star general proudly recounts how he spent 'two hours watching footage' beamed to his headquarters. Sitting behind a live video feed from a Predator

unmanned aircraft system (UAS), he saw two insurgent leaders sneak into a compound, openly carrying weapons…Having personally checked the situation, he gave the order to strike. But his role didn't end there; the general proudly tells how he even decided what size bomb his pilots should drop on the compound."[56] In the two hours that the general spent at the tactical level of war, what analysis and consideration did he pay to the operational and strategic levels of war?[57] The U.S. Navy faces the same danger of a loss of focus at the higher levels of war if commanders spend time and energy on tactical events.

Furthermore, rigid centralization destroys the subordinate's ability to develop their decision making at the tactical level. Without the experience of decision making at the tactical level of war, what lessons will they draw on to make decisions at the operational or strategic level?[58] How will the U.S. Navy even identify the subordinates able to lead at higher levels of war without a clear evaluation of their ability to function at lower levels with a degree of autonomy? In "Role Making and the Assumption of Leadership," Bruce T. Caine, a former U.S. Army officer and current professor of organizational psychology, states that there is an explicit linkage between autonomy and leadership development.[59] The progression of a subordinate to a leadership position relies upon the continuous assessment of their ability to perform tasks, with the successful completion of those tasks resulting in a decrease of supervision.[60] Implicit in this model of command organization is a concept for leadership renewal. Subordinates are provided with the opportunity to build the experience that they will need to move into a leadership role at a higher level.

The unintended consequence of a strategic or operational commander making decisions at a tactical level is the inhibition of the development of future strategic or operational leaders. Using Caine's framework for assessment with the example of the four star general and the pilot, to what degree did that pilot learn from the execution of his or her bombing mission? Inhibited from making even the most basic decisions about the weaponeering of his or her attack, to what degree will they be able to make more difficult decisions at the higher levels of war? Furthermore, divorced from the responsibility inherent to autonomous decision making at the tactical level, how can their commander even determine their suitability to serve as a decision maker at the operational or strategic levels of war?

<u>The First Step is Admitting You Have a Problem</u>

In a recent survey of 55 in-resident U.S. Navy officers attending the Naval War College, 38.5 percent of the respondents stated that they believed the U.S. Navy practiced centralized C2.[61] While the sample size of the survey is limited, the results suggest a dissonance between the service's stated preferences for decentralized C2 organization and reality. Senior Navy leadership should survey currently serving officers and senior enlisted personnel to determine the extent of that disconnect, and if it is particularly pervasive in specific warfare communities or combatant types.

Military officers have consistently complained about a "zero defect" mentality that inhibits initiative and independent thought and have heard the same complaints from Flag and General Officers.[62] To what degree has this perception shaped the decision of commanders to centralize control?

Additionally, if commanders make Mission Command their guiding tenet for C2 organization, to what degree does his or her staff understand how that determines their interactions with the commander's subordinates? In an interview conducted with a U.S. Navy Captain who had previously held command of a surface vessel, a commander's staff was viewed as equally, if not more likely, to "reach into the command" as the commander themselves.[63]

Mission Command should feature prominently in the professional education of U.S. Navy Sailors and Officers. It is not enough to circulate General Dempsey's white paper on an "all-read" board. The tenets of Mission Command are best considered when set against the chaos of major combat. Historical case studies and expected combat scenarios would provide Navy leaders with the ability to further develop their decision making abilities. Finally, there are likely few documents that provide a more succinct and accessible consideration of the relationship between decentralized command, individual initiative, and success in combat than the United States Marine Corps' doctrinal publication, MCDP-1 "Warfighting." The U.S. Navy should endorse "Warfighting" as a publication applicable to all naval personnel and include it in the professional education of Navy enlisted personnel and officers.

As previously discussed, the communications and computer networking technologies that facilitate centralized C2 organization are vulnerable to attack. While the U.S. Navy should continue its efforts to harden those networks, it should also train in a communications degraded or denied environment. In the event of war with the People's Republic of China, surface vessels distributed throughout the expanse of the Western Pacific may experience a series of pitched and highly localized tactical engagements. Accordingly, survival—much less success—in the initial stages of the next war at sea will rely on the initiative and decision making of individual commanders. If the U.S. Navy does not train towards this possibility in peace, it will pay with blood and ships in war.

A decentralized C2 organization may prove equally necessary to counter an asymmetric or irregular threat. A post-command Surface Warfare Officer in the Sri Lankan Navy, with recent combat experience at sea, identified Mission Command as necessary to their victory over the Tamil Sea Tigers.[64] His commander issued intent but allowed him to determine how best to meet it.[65] Faced with swarming attacks, suicide vessels, and the intermingling of civilian vessels and combatants, the commander of the Sri Lankan Navy, Vice-Admiral Wasantha Karannagoda, credited their success to their ability to "improvise and use innovation and ingenuity."[66] As the U.S. Navy trains to counter the FAC/FIAC threat in the Arabian Gulf, it should closely study the lessons learned by the Sri Lankan Navy.

Net-working is a Capability; C2 Organization is a Choice

The U.S. Navy's surface fleet may find itself engaged in major naval combat in the near future. While the modern fleet possesses highly advanced communications and data-networking technology, centuries of written history suggest that no advance in technology has successfully eliminated the fog of war. In contrast, victory is often gained by the force best able to exploit it. By training and educating its personnel on the tenets of Mission Command and embracing it as a critical component of its service culture, the U.S. Navy can create a human network of initiative, ingenuity, and lethality.

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[66] Jane's International, "Sri Lankan's Learn to Counter Sea Tiger's Swarm Tactics", p. 21. http://www.defence.lk/mwg-internal/de5fs23hu73ds/progress?id=Kn5zaBJ4W2, Accessed 1 May 2014.