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ADDRESSING THE COMMUNICATIONS GAP BETWEEN THE U.S. MARINE CORPS
AND NAVY JOINT OPERATIONS IN A NEW SECURITY ENVIRONMENT

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
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Executive Summary

Title: Addressing the Communications Gap between the U.S Marine Corps and Navy Joint Operations in a New Security Environment

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Thesis: Any new effort to improve communication interoperability should include the following reforms: a concrete policy for timely recourse to deal with disputes, increased communication integration aboard ships, more combined education of Marine on Navy technology, and USMC adoption of new USN standards for purchasing future communications equipment.

Discussion: There is a need to streamline the bureaucracy that hampers communication integration between the United States Navy and Marine Corps. This study looks at the obstacles to effectively integrating USMC and USN Command, Control, and Communications for Operations in the contested environments of the 21st Century. This study also examines many of the bureaucratic obstacles to improving interoperability between the Navy and the Marine Corps and provides examples of how they have been overcome in previous occasions. Lastly, a detailed look at the Amphibious Marine Corps Air Ground Task Force C4 Requirements Capabilities Letter, Training and education deficiencies, and the Hardware Open System Technologies will reinforce the changes that need to be made to transform the individual communicator and the process for integration with the Navy.

Conclusion: Improving Navy/USMC interoperability in a contested threat environment is a complex problem that requires a multifaceted solution. Any changes in equipment must also be linked with a change in training and education at all levels. It is past time for the Navy and Marine Corps to make progress to remedy this situation that has been building for years.

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Preface

The basis of this research began with my time with the 31st Marine Expeditionary Unit (MEU) in Okinawa, Japan and my experience as a young communications officer. While with the MEU, our team addressed systemic communication problems that had been prevalent on board the vessels for several rotations. Here at the Command and Staff college I was given a venue to bring those problems and solutions to leadership. The research I completed refocused my question and allowed me to reach out to those individuals who were truly responsible for making change in the Fleet Marine Force (FMF).

I would like to thank my leadership for their exceptional guidance and support throughout this process. I would also like to thank all the research librarians and curators; without whose support I would not have been able to conduct this analysis. To my colleagues within the Marine Corps especially those communicators who assisted in debating and red teaming my solutions to these problems, I offer my gratitude. Lastly, I want to thank my family which allowed me to concentrate while completing this project.

I hope this study generates the debate it deserves.

I. Introduction

If integrating communication systems was easy, the United States Navy (USN) and United States Marine Corps (USMC) would have done it a long time ago. During the final Defense Forum of 2020 in Washington DC, the Commandant of the Marine Corps (CMC) General David H. Berger while talking about integration stated, “Why now – one reason why is we’re pressed by at least one adversary that we haven’t had in decades.”¹ It has taken the emergence of a true near-peer adversary for the Department of Defense (DOD) to move past the status quo of unimpeded military dominance, and into a new world where the DOD has limited control of air, land, sea, space, and spectrum. As the USN and USMC team moves forward to enact the Chief of Naval Operations (CNO) and CMC’s planning guidance of more naval integration, it will not be achieved until both services integrate their Command-and-Control (C2) information systems.² Any new effort to improve communication interoperability must include the following reforms: a concrete policy for timely recourse to deal with disputes, increased communication integration aboard ships, more combined education of Marines on Navy technology, and USMC adoption of new USN standards for purchasing future communications equipment.

These problems in the integration of USMC and USN communication technologies have been recognized for many years. Both services must now overcome the gaps in communication integration to protect American lives, deter our enemies, and evolve future joint maritime operations. Overcoming these communications gaps will

only be possible if the highest level of leadership from both services become involved and make this a priority.

In 2019, the CMC released his planning guidance for the Fleet Marine Force (FMF) that centered on force design as its first priority. The CMC has been very clear that the USMC's problem is that, "the current force is not organized, trained, or equipped to support the naval force operating in contested maritime spaces, facilitating sea control, or executing distributed maritime operations. We must change. We must divest of legacy capabilities that do not meet our future requirements, regardless of their past operational efficacy."³ Our adversaries have developed tactics and technology to not only degrade DOD communications, but also to disrupt and deny those same legacy platforms. If the USMC and the USN choose not to integrate on our terms, our enemies will force us to conform to theirs. Commanders are echoing the need for integration now to build those relationships between the services . USMC Col Michael Nakoieczny emphasizes the need for service-level integration as follows:

Integration among the Navy-Marine Corps team is both an art and a science- one that the 31st Marine Expeditionary Unit (MEU) and America Amphibious Ready Group (ARG) are committed to mastering. In order to remain ready and lethal while operating in a more distributed domain, both commands recognize that fully integrating the Blue - Green Team is more than just a good idea; it's a necessity.⁴

History has proven that communication on the battlefield holds the key to victory. In the past, military forces have used a multitude of communication assets from drum beats, smoke signals, and signal flags to satellite communications. Platforms now provide real-time information on activities in the air, on land, and at sea to the Joint Force Commander on multiple common operational picture (COP) platforms such as Command and Control Personal Computer (C2PC) from the respective services. The future joint

command and control structure will only be effective for use by the commander if they are integrated. The present-day peer enemy as described in the National Defense Strategy (NDS) has access to sophisticated Anti-Access/Anti-Denial capabilities and today's force must prioritize developing networks that are resilient, survivable, and integrated to survive this threat.⁵ The CMC demanded that the Marine Corps change the status quo of how they conduct business and become more integrated with the USN. Similarly, the USN released Fragmentary Order 01/2019: A design for maintaining maritime superiority, which reinforced the need for integration between the two services.⁶ Commanders in both services have been given guidance on this issue from higher headquarters. Now the force must put in place tangible programs that can be judged on how well they support the two services' integration.

II. The Obstacles to Integrating USMC and USN Command, Control, and Communication for Operations in the Contested Environments of the 21st Century

An audacious change is needed in the way the USN and USMC integrate their communication systems. The Marine Corps has released maritime C4 requirements in numerous designs since 1992.⁷ The current and most enduring is the Afloat Marine Air-Ground Task Force C4 Required Capabilities (AMC4RC) Letter. The AMC4RC letter is the primary document that verbalizes C4 required capabilities to support maritime and amphibious operations to the USN for near-term funding into the USN's Program Objective Memorandum (POM) cycle.⁸ The main problem with the AMC4RC letter is that it lacks a venue for recourse to deal with interservice disagreements that surface and must not be the end all be all for Marine Corps integration aboard Naval vessels. To

better understand why the USMC must enhance or move away from the AMC4RC letter altogether, first we must look at how the letter has been hampered by a bureaucratic system and the time it takes to get from the tactical requirement to installation aboard ship and why that timeline is so protracted. Secondly, how current sailors and Marine are using trial and error to work around integration problems before, during, and after deployment. Finally, how can the USN and USMC change their processes to streamline them and bring them into the future.

Integration and interoperability are two words that are constantly misunderstood when discussing communication equipment. Joint Publication 1-02 Dictionary of Military and Associated Terms defines integration as the arrangement of military forces and their actions to create a force that operates by engaging as a whole and interoperability as the condition achieved among communication-electronics systems or items of communication-electronics equipment when information or services can be exchanged directly and satisfactorily between them and/or their users.⁹ Currently, the USMC uses both integration and interoperability to complete its mission when deployed aboard ship. The AMC4RC uses integration as its default to ensure that USMC systems are tailored to a certain naval vessel baseline and interoperability for those conventional communications away from the ship. Before deploying and due to space constraints, the USMC works to integrate their equipment within the ships baseline.¹⁰ The majority of the USN's equipment is built into the ship and is set once the ship is deployed, which ensures changes to the baseline will be difficult to make. The USMC also conducts missions from ship to shore. This mission requires USMC organic communication systems be interoperable with the ships communication systems. In the CMC's planning guidance

under Assured C2, his third critical characteristic is interoperability and goes on to say, “All elements of the MAGTF must be able to quickly collaborate and communicate across common hardware systems and platforms.”¹¹ By addressing this distinction between integration and interoperability it will further the conversation being had throughout the USMC in regards to the AMC4RC and the Marines on the tactical level going around this obstacle to complete the mission.

In my interview with Marine Corps, Major Ryan Ackland, Naval Systems Integration Officer, Test, and Certification Division at Marine Corps Tactical Systems Support Activity (MCTSSA) he listed a handful of current obstacles with integration that have been on the AMC4RC for years without resolution.

- (1) The USN supports the USMC in a myriad of ways aboard ship and ashore. This support is called Blue in Support of Green (BISOG) and it works through Modernization of equipment, Readiness of Tier 1 gear (everything that is integrated into the ships baseline), and budgeting for gear primarily used by the USMC (Green gear). This is where the AMC4RC has the majority of its relevance.
- (2) Lack of BISOG training on both the USN and USMC side for nearly all systems; this integration is done mostly with on-the-job training (OJT) and is not consistent with all naval platforms. Standardized training is needed from formal schooling to those secondary schools to enhance the force.
- (3) Boundary change request (BCR)¹² from the USMC to the USN and the long lead times it takes to complete. This is a twofold problem that

deals with administrative rights on the USN Network and a need to be knowledgeable on the process. Due to the bureaucracy, the BCR will not go into effect if the process is done incorrectly.

- (4) Difficulty in managing certain communication networks, virtualization of servers, firewalls and other enterprise services without leveraging Microsoft contractor support to assist in troubleshooting.¹³

The fact that these issues have not been addressed in a timely manner requires action on all levels to institute change. Major Ackland's perspective was derived from three years as the communication officer for the 26th Marine Expeditionary Unit (MEU) before his current position. He has lived these problems in one form or another and worked to solve them.

The AMC4RC letter is a relic of the past. It has been around the USMC since 1992 listing the requisite capabilities to support Marine Corps ship to shore operations.¹⁴ The process of gathering and sending requirements to the USN is needed, but there is a disconnect between the relevance of the information provided to the USN and the time it takes to get what is needed to accomplish the mission at hand by the warfighter. The letter is prepared annually by the Maritime Expeditionary Warfare Integration Division (MEWID) for Combat Development & Integration. This division specifies the AMC4RC includes, "(1) prioritized list for direct near-term POM development for USMC and MPF platforms, (2) capabilities required to support USMC war-fighting functions, (3) required services with detailed technical specifications to facilitate integrated solutions, (4) network connections and telephony requirements by vessel class and space, and (5) afloat baseline that list system required aboard designated class ships

to conduct operations and assigned missions.”¹⁵ As all of this information is gathered and synthesized, time is going by. In the past, from the decision point to start a program of record to the initial operational capability date or completion date, the entire process was averaging around eight years.¹⁶ In Marine Corps time, that equates to two permanent changes of stations and at least one change of grade by the original submitter.

Both the CNO and the CMC in multiple discussions have quoted the 2018 National Defense Strategy, which emphasized the need to move into the future with acquisition and work within the “speed of relevance.”¹⁷ Also, they have instructed their Sailors and Marine to look for more ways to become integrated. Below are a few success stories where sailors and Marine thought outside the box or requested help to accomplish the mission without the AMC4RC.

Between January and March of 2020, the Marine Corps Tactical Systems Support Activity (MCTSSA) conducted a C4 interoperability test to effectively integrate Marine Corps and Navy systems. Matt Gonzales from the Marine Corps System Command (MCSC) office of Public Affairs traveled with them and wrote a report on their actions for CHIPS – The Department of the Navy’s Information Technology Magazine. The MCTSSA team stated, “The purpose of the testing was to ensure Marine Corps C4 technologies and Navy-provided shipboard communications systems functioned as designed and were interoperable with one another. The intent is to ultimately increase Forward Deployed Naval Forces combat readiness.”¹⁸ In this occurrence, MCTSSA was requested by the communication officer to solve some of the issues that he witnessed during a previous deployment. In the past, Marine communicators that were tasked with performing these jobs were removed from the waterfront to support the buildup for

Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). This loss in manning resulted in BISOG Tier 1 systems not receiving the desired level of attention in the Naval maintenance casualty reporting (CASREP) process. In 2019, the General Officer Force Optimization Review Group (GO FORG) approved the further development and manning of Amphibious Communication Detachments (ACD) in an attempt to bring back that tactical edge integration with the USN.¹⁹ These detachments would work with the USN shipboard crew to keep a persistent local classified and unclassified network along with Tier 1 equipment serviceable while the main Marine force is not embarked. The testbed is currently being coordinated by Expeditionary Strike Group – 7 (ESG-7), Combined Task Force -76 (CTF-76) out of Okinawa Japan, and are scheduled to be fully operational capable in FY23. Returning this capability will solve a few of the issues such as oversight of the C4I BISOG systems, but it is only a start in repairing the relationship between the two services and will not address the root issue of USMC adapting to a USN communication network. Detachment commander Major Joseph Rivera stated that this is a great opportunity to test this concept because of the constant deployment that the 31st Marine Expeditionary Unit undertakes during the year. As of now they are at about 50% manning and looking forward to being 100%.²⁰

Mallory Shelbourne’s article, “Navy’s ‘Project Overwatch’ Structure Aims to Accelerate Creating Naval Battle Network” provides another example of how the services are making progress on interoperability.²¹ This article shows a need for a Joint Common Operating Picture with the ability to pull in informational data tracks from multiple platforms independent of each service. In his description of Project Overwatch Vice Admiral Jim Kilby stated, “That is, in essence, how we look at our naval tactical

grid – naval, not Navy tactical grid – with a thought about the joint force.”²² Project Overmatch aligned Naval and Marine Corps planners to work on an approach to find common networks that operate within the joint force. This approach of having both services in the room at the same time while planning major purchases would limit the difference in equipment strings that both services procure. One such instance tied directly to Project Overmatch is the development of the Naval Integrated Fire Control-Counter Air (NIFC-CA) network. NIFC-CA combined information from various platforms such as ships and aircraft to provide a more complete representation of information to leadership.²³ NIFC-CA shows that you can seamlessly move data through all domains. Still, this type of integrated planning is what the CMC is demanding and should be duplicated. The original requirement that was put forth by the team was, “any sensor, any shooter.”²⁴ Shelbourne quotes LtGen Smith USMC and later Rear Adm. Small on why certain equipment needs to be customized to be a certain size and weight for certain platforms and how the USN and USMC are going to industry together with a requirement of demanding the same capability from different equipment sets. Project Overmatch is in its infancy with Rear Adm. Doug Small the commander of the Naval Information Warfare Systems Command at the helm to chart the course for the program for the next decade.²⁵

The next example is between a success and a failure. It is looked at as a success because of the new capabilities that it provides to the warfighter and a failure only because of the time it took to become fully operational. The Mobile User Objective System (MUOS) is a narrowband satellite communication system that in October of 2019 completed its Multi-service Operational Test and Evaluation. Ben Werner wrote an

article, “MUOS Passes Final Tests Before Full Operational Capability (FOC) Declaration” where he celebrated the work that both the Navy and Marine Corps team accomplished in bringing this capability to FOC.²⁶ The article discusses how this new system will replace an older legacy system and how it will support the warfighter to compete, deter, and win on the battlefield.²⁷ This system had been planned and executed by the Navy and Marine Corps acquisition team in late 2004. The MUOS constellation is manned by the USN and provides reliable 3G capability across the globe. In March of 2020 the USMC and USN team in coordination with the US Army Threat Systems Management Office intentionally jammed parts of the electromagnetic spectrum to interfere with MUOS communication during exercise Steel Knight 20.²⁸ The system excelled at three main targets, (1) it reduced the electronic footprint of the command post, (2) it gave greater bandwidth to lower echelons, and (3) it provided wireless internet at the secret level.²⁹ In the end, Major General Robert Castellvi, commanding general of the 1st Marine Division gave positive marks on the work the USN and USMC team is doing to take advantage of the new capabilities that MUOS provides.

Like many success stories of Marines and sailors working together to carry out the instructions from their respective leadership, there are also stories of innovation and teamwork going in the opposite direction. Below are two failures that have since been rectified.

The Enhanced Manpack UHF Tactical (EMUT) Conical Logarithmic Spiral Mobile (CLSM) antenna is one of the primary sources of embarked Marine’s radio communication that has been in use since early 2000. This system is used to provide over the horizon, ship-to-shore communication. When operational the EMUT worked, but in

my own experience when a problem occurred with the EMUT there was never a naval technician available to fix the problem. Mainly the issue revolved around the EMUT being thought of as “Green gear” and the USN technicians were not trained on how to fix this equipment while at sea. When this would happen, the Marines would have to link their tactical radios from the crow’s nest outside the ship directly to the Landing Force Operational Center (LFOC). This workaround was dependent upon the course of the ship and the location of the satellite to which the radio operator was radiating. Due to the location of the superstructure aboard the ship emitting more powerful signals, the smaller manpack signal would be easily drowned out. The result of not having the EMUT antenna would force the landing force commander to be limited to UHF voice communication over Demand assigned Multiple Access (DAMA) for all ship to shore communications. In 2012 during the Navy Fleet experiment Trident Warrior, a team from the Naval Research Laboratory Tactical Satellite-4 completed three weeks of intense training and testing aboard the USS Essex on the EMUT with Marines ashore at Camp Pendleton, California. During that, exercise training and testing were completed by both parties that allowed standard operating procedures to be developed for the EMUT.³⁰ This is additional example of the USMC and USN team working together, but those operating procedures did not spread to the greater force. Unfortunately, the Tactics, Techniques and Procedures (TTPs) developed were lost after the exercise.

Another problem that can be tied directly back to the AMC4RC is how Marine Corps gear is embarked and installed into the Navy’s infrastructure. To get a true understanding of the problem you must first understand how the current USN and USMC team operates with regard to shipboard operations. The Marine Corps Maritime

Expeditionary Warfare annual report from 2017 stated, “Marines operating from aboard a US Naval vessel rely on the ship to provide communications and networks infrastructure, referred to as Tier 1 equipment. You can think of tier 1 equipment as everything that is aboard the ship before Marines embark. Marines carry on computers (laptops, servers, radios, and other support equipment) to plug into and augment the shipboard networks with Command, Control, and Situational Awareness applications referred to as Tier 2 equipment.”³¹ The Tier system brings to the forefront a glaring problem that the USMC is usually treated as a guest aboard Navy vessels and afforded only those privileges of a guest the majority of the time. Another problem is that the priorities of a guest are usually secondary to those of the host. When dealing with predetermined resources such as equipment space and spectrum usage the discussion of who uses what and when is of more importance.

In the fourth quarter of 2019, the Marine Corps conducted a field user evaluation of the AN/PRC 158 (Software Defined Radio System) in an attempt to have them to the operating forces before 2024. The change to software-defined radio systems is mostly being done to adhere to a mandate released by the National Security Agency that requires all radios not compliant with cryptographic modernization standards be replaced by 2024.³² The AN/PRC 158 gives the user access to frequencies from 30-3000 MHz. That encompasses Very High Frequency (VHF), Ultra High Frequency (UHF), Satellite Communication, Mobile User Objective System (MUOS), and some wideband data services in the L-band. The multiple bands provided gives the commander more access to voice and data systems in a denied environment. The PRC-158 has all this capability and more within the same form factor of its predecessor the AN/PRC-117G and is an

extremely capable piece of equipment. This new radio would be considered a tier 2 technology and if the past has any bearing on the future, it would be limited on the deployment to naval vessels. Since the USN works on an internal maintenance and upgrade schedule, it is highly unlikely for them to change the ship's baseline to accommodate this new equipment. The majority of the time when key upgrades are installed is usually during the five-year maintenance rotation cycle and once again this new technology would fall short.

III. Essential Steps to Secure USMC and USN Command, Control, and Communications in Contested Environments

To truly comply with the CMC's Planning Guidance on integration, the Marine Corps must learn from the examples discussed earlier and urgently reform its C2 relationship with the Navy. This includes instituting a concrete policy for timely recourse to deal with disputes, increased communication integration aboard ships, more combined education of Marine on Navy technology, and USMC adoption of new USN standards for purchasing future communications equipment. The AMC4RC letter is an important document but it is also an artifact of the status quo and needs to be replaced with a more dynamic bottom-up process that brings in not only those on the tactical layer but those who maintain the ships. With more involvement from the tactical level on both the Navy and Marine Corps side to petition the integration of tiers, that would lead to a process that yields closure. Each service is unique and has its own customs toward integration. By understanding how the services are made up we will have a better understanding of how to bring them together.

The USMC and the USN equally have complex administration systems that at times have obstructed the integration of communication between the services. The status quo of C2 integration now depends upon an antiquated system of the USMC providing a required capabilities letter to the USN to request onboard communication support. The USN has the right to deny, shelve, or postpone these requests in favor of a higher priority project and the main recourse that USMC has is to send a complaint letter. Those instances in which the priorities of the USMC align with the USN are few. The primary reason is due to the maintenance cycle of Naval ships and how they are in constant rotation for upgrades. Naval platforms have a service life of around 30 years with the capability of an extension to 45 years.³³ Within this time frame communication technology changes every two to three years. The time it takes to get communication equipment approved, tested, and installed onboard Navy vessels almost ensures the equipment will be obsolete upon fielding.

The basis for how the USMC fights is through the Marine Air-Ground Task Force (MAGTF); a balanced air, ground, and logistics component that has been combined and task-organized under a single commander, structured to accomplish a specific mission.³⁴ The MAGTF concept is important to understand because the USMC structures its policy to reinforce the lethality of the MAGTF. Within almost every document the core message is how does the policy strengthen the force.

AMC4RC Letter.

The message of the MAGTF is evident in the AMC4RC letter.³⁵ The AMC4RC letter is the primary document that verbalizes C4 required capabilities to support maritime and amphibious operations to the USN for near-term funding into the USN's Program Objective Memorandum (POM) cycle.³⁶ The AMC4RC is processed through multiple units such as Marine Corps System Command, Head Quarters Marine Corps, Operational Navy, and lastly to Naval Information Warfare Systems Command where the request is added to the Navy's budget. The letter communicates C4 gaps, capabilities, and services required from an operational perspective while assisting in the development of afloat modernization programs. All six enclosures of the letter work to define the USMC's priorities and align with the Commandant's Planning Guidance.

In the same way that the MAGTF is the basis of how the USMC fights the individual ship is at the core of how the USN fleet fights. Chief of Naval Operations (CNO) Admiral Michael M. Gilday states, "Sea control, power projection and the capability to dominate the oceans must be our primary focus."³⁷ Having a credible combat-ready force deployed forward gives U.S. leaders options for any challenges that arise. The USN fleet is the basis of protecting commerce and deterring adversaries from our shores with the individual sailor and their ship at its core. Also, all Marines must understand while they are embarked onboard vessels, they become a part of the Naval fighting force and an extension of the fleet, a tool for the commander. Both services have history and traditional ways that they conduct blue (Navy) and green (Marine Corps) integration that they are reluctant to modify.

The time from issue identification at the tactical level to resolution is too long. Policies such as the AMC4RC letter that are in place at the highest levels have a tendency to slow all meaningful conversations that are being addressed at the tactical level. The status quo is shown by correspondence sent from the Assistant Deputy Commandant (DC) CD&I Major General Wise to the office of the USN Deputy Warfare Integration Directorate discussing the critical concerns MGEN Wise's team has about the financial decisions being made in regards to the BISOG Command and Control equipment not being funded.³⁸ This correspondence is the main recourse that the USMC has after almost five years of divestment by the USN. The USN responded with a similar letter acknowledging the USMC's concerns in regards to the divestment and agreeing to the establishment of the Enhanced Naval Amphibious Baseline (eNAB) group.³⁹ The DC CD&I also offered to provide the secretariat to lead this revitalized effort. This group will work in concert with the ACD's to provide an efficient pipeline to issues. The eNAB group and ACD's are a step in the right direction by having a team of technicians with the ESG to conduct the routine maintenance while preparing the ship for emerging technologies on the green side.

Still, that is not enough if we are looking for the bold change that is called for in the CMC's planning guidance and the CNO NAVPLAN. Two items are needed to supplement the AMC4RC to make it an efficient product. (1) The MEU S-6 is the lead Marine communication officer and is responsible for the unit's communication aboard the ship and ashore. In this role the S-6 should attend a quarterly meeting with the Deputy Commandant for Combat Development & Integration staff, ACD Commander, Operations Navy Staff 2, and PEO to discuss, priorities of support, baseline change

request, and any other outstanding issues that might arise. The S-6 would attend these meetings even while embarked. The S-6 must be able to speak directly to those leaders in the room who can assist in changing the current situation. These conversations should lead to tangible outcomes that show a funding line attached to those high priorities. (2) Detail with the Navy Communication Officer a partnership that would allow for consolidation of the Greenside network into the blue side network through virtualization of servers. As it stands now, the embarking Marines currently duplicate just about all of the Navy's C2 capabilities. This item would replace the need for the majority of Greenside gear, but burden the Navy with a multitude of other issues that they currently do not deal with. This burden would be alleviated with assistance from the ACD. With the help of the ACD's this partnership will allow for account creation, security checks, and network monitoring to list a few newly required tasks for the blue side. These measures to compliment the AMC4RC would allow for direct contact from the blunt tactical layer to service level leadership that will change the timeline of projects.

Those two suggestions would immediately change the way the AMC4RC is approached, but until there are budgeting dollars attached to this initiative or any other like it these items will only be aspirational. On March 20, 2020, Deputy Commandant Lieutenant General Eric M. Smith briefed the House Armed Services Committee on Marine Corps Ground Programs in which communication is a part. He touched upon the Naval tactical Grid and how it will support Joint All Domain Command and Control (JADC2) in providing timely, secure, and persistent information exchange while enhancing the battlespace awareness to dispersed tactical units, but nowhere did he explain how the Marine Corps was assisting in testing or validating how the grid

worked.⁴⁰ This would have been an ideal time to put forth a well-devised strategy to better integrate the Navy and Marine Corps communication capabilities and attach a budget line of accounting.

Service Member Education and Training

To gain the trust of our naval teammates, Marine communicators on all levels must attend and graduate from technical classes on naval communication systems. At this time the Marine Corps lacks a core training and education continuum to address the needs of the force after their initial formal schooling. The Marine Corps Communication Training Advisory Group (CTAG) that is made up from USMC communications subject matter experts from the FMF, along with those at the communication schoolhouse, have been working to solve the question of a lifelong communicator education program. This program is an attempt to create an overarching process from formal schooling to an extended version of on-the-job training. The re-evaluation of the communication curriculum is in line with the CMC planning guidance that states, “Training must include appropriate background reading, tactical decision games, modeling, and simulations, and augmented reality. Everything should be subject to a formal critique, which is a particularly important part of performance-oriented training.”⁴¹ The most important part of this quote is the ability to formally critique the training to make it better. Furthermore, the CTAG has instructed the communication schoolhouse to institute training and educational support packages that educate Marines in the fleet on Navy processes, structure, and system. These support packages will include virtual training, on-the-job

training, and subject matter expert support to ensure the instructor is where they are most needed.

Having a proficient communicator is required at the ACDs. The ACD billet must be on the essential billet list while having minimum training and education requirements specified. The Marines that fill the ACD billets must be screened and show they have completed standardized formal school training, baseline OJT, along with other communication training associated with naval systems such as MAGTF Router or System Administration. Also, for Officers and Senior Staff Non-Commissioned Officers they should attend the Information Communications Management course taught by the US Navy Information Warfare Training Center for Navy-specific communication equipment and information on how it is employed. The instruction that they have completed must complement C4 naval integration and fill any gaps in the communicator's knowledge base. Additionally, MCTSSA offers a MAGTF Afloat integration environment that can provide hands-on training of Tier 1 systems such as the EMUT antenna and a replica Landing Force operations Center (LFOC). Each Marine communicator must have a good understanding of Navy processes, structure, and systems to improve integration.

The Consolidated Afloat Networks and Enterprise Service (CANES) is the most important platform onboard the ship for Navy communicators. The best way to gain access to this area is to first show those Navy communicators who administer the Network that you understand the complexities of the equipment. CANES is a USN program of record that is replacing existing afloat networks and providing the necessary infrastructure for applications, systems, and services required for the Navy to dominate the Cyber Warfare domain.⁴² CANES touches every system within the ship. It is

therefore necessary for some Marine communication experts to be trained in using CANES effectively and maintaining it safely. Education is the key to unlocking the mistrust that sailors have when dealing with Marine communicators. By graduating from Navy courses or having a certain certification that can be displayed, Marine communicators could gain approval fix interoperability problems with Navy systems. Also, inviting Navy experts to take part in USMC communication training would build valuable bridges between the communications specialists in both services.

Hardware Open System Technologies (HOST)

Now is the time to engage with the USN directly. Admiral Gilday CNO stated in FRAGO 01/2019 in Leverage the power of the Integrated Fleet, “Together, we will build Navy-Marine Corps integration by aligning concepts, capabilities, programming, planning, budgeting, and operations to provide Integrated American Naval Power to the Joint Force.” One such process that the Marine Corps must engage with the USN is with their use of Hardware Open System Technologies (HOST). The HOST standard was initiated by the U.S. Navy’s Naval Air System’s Command (NAVAIR) at Patuxent River in 2014 and provides a framework for developing defense systems.⁴³ Understanding the HOST standard is extremely important when engaging with the USN in their tier 1 equipment installation. HOST uses commercial off the shelf (COTS) technology to develop a non-proprietary and publicly available architecture standard, allowing unlimited access to all necessary information to produce aligned hardware and modules.⁴⁴ One of the keys to HOST is that the technology is non-proprietary which will allow for a

greater depth of vendors using the standard to create new technology. If the USMC adopts this standard in procuring future communication equipment it will allow for a host of benefits. One benefit is a smoother transition from tier 2 to tier 1 installation. Another benefit is both USMC and USN program offices have verifiable requirements to place in their acquisition documents. Standardization of systems gives you an agreement between technological platforms making it possible to share components while improving interoperability.

HOST has five key Goals:

- (1) Increase interoperability and interchangeability – severable hardware modules to be changed independently.
- (2) Incorporate Innovation – operational flexibility to configure and reconfigure available assets to meet rapidly changing operational requirements.
- (3) Decrease Upgrade time and Lifecycle Cost – use of Commercial off the Shelf (COTS) technology to break vendor locks, leading to faster upgrade time and lower component costs.
- (4) Improve Competition – open architecture with well-defined interfaces and severable modules, allowing modules to be openly competed.
- (5) Promote Module Reuse – reuse of technology, modules, and/or components from suppliers across different programs.⁴⁵

Integration is the arrangement of military forces and their actions to create a force that operates by engaging as a whole.⁴⁶ To completely adhere to the CMC's planning guidance the Marine Corps must change the way it does business. Currently, the latest Marine Corps strategy for Assured C2 is from March 2017. Nevertheless, the goals for

equipment procurement run in tandem with HOST-based standards. There is a need to reduce purchasing software and hardware in favor of as-a-service agreements.⁴⁷ That in combination with HOST standards could guarantee the equipment purchased by the Marine Corps is compatible with naval vessels without the delay in more testing and validation. What the communication community is looking for is a solution that is sustainable and upgradeable using the latest technology.

Subsequently, we must work as a team going forward. This begins during the planning phase as emerging technology becomes more assessable. As the USN works to create test beds for emerging operational capabilities and builds the Naval Innovation Network, the USMC must coordinate to gain insight on what worked with this approach and those lessons learned. Former Secretary of the Navy Ray Mabus stated, “Right now, there are examples of innovation occurring in pockets all over the Fleet. We owe all our sailors, Marine, and civilians a platform by which their ideas can reach the decision-makers.”⁴⁸ In essence, he wanted to break down the wall that is stifling innovation in our service members. Unfortunately, necessary innovation and modernization is delayed due to policies that have outlived their usefulness such as the AMC4RC. The problem will never be fixed until the Marine Corps commits to reforms such as the ones explained in this study.

The arguments and opinions contained within this study are based on relevant open-source information, news articles, service level guidance, interviews, and official government documents. This research shows that the recommendations in this study are important first steps to improving C2 interoperability between the Marine Corps and the

Navy.. But further research and analysis is also needed to fully resolve these problems and identify future stakeholders in this process. .

IV. Conclusion

Changing a policy is extremely hard, but in this case, it is feasible because the Commandant and CNO have both made a priority of improving USMC/Navy integration and interoperability. Part of the challenge is to educate leaders of both services about how to make such improvements in the all-important world of command, control, and communications. To carry out the necessary reforms, the Marine Corps must have a concrete policy for timely recourse to deal with disputes, increased communication integration aboard ships, more combined education of Marine on Navy technology, and USMC adoption of new USN standards for purchasing future communications equipment. The AMC4RC letter is a policy that worked well in the past for the Marine Corps and Navy team. Now it is just too burdensome for the speed at which critical C2 issues need to be resolved.

If it takes five years for a piece of equipment that has been certified to operate on the ground to be placed on the AMC4RC and wait to be validated, tested, and confirmed not to be hazardous to the ship before it can be allowed on board and integrated as a tier 2 piece of equipment, it shows there is a problem with the system. Leaders to choose the path of complacency and inertia. The status quo may seem easier than change, but in today's security environment any delays in C2 may cost lives when Marine and sailors are in harm's way.

Therefore, the Marine Corps needs a better process to address the needs of its warfighters that consistently take the brunt of delays and a delinquent system. By including the MEU's S-6 in quarterly meetings with the Navy's DC&I staff, together they can identify problems more quickly and take them to leadership for decisions and timely resolution. When the Marine Corps updates its training and education to include naval integration, we will become a more professional force. If the S-6 works in concert with the Navy Communication Officer to reduce the need for a greenside network, this would be a valuable breakthrough for C2 intergration. If the Marine Corps moves to a more HOST-based standardization system like the Navy then the Marine Corps would be closer to the integration demanded by the CMC.

LtGen Smith stated in his brief to the House Armed Services Committee, "The Marine Corps is not embarking on this mission alone. Through the Integrated Naval force Structure Assessment, collaboration on naval warfighting concepts and doctrine, and joint wargaming and experimentation, we will build a naval force design that integrates capabilities across the warfighting domains, defines how we operate, and results in solutions that are creative, relevant, and resilient."⁴⁹ The problems impeding effective Navy/Marine C3 interoperability are complex, but the recommendations in this study point the way forward. If these steps are taken, both services will be in much better shape to face current and future threats to our forces.

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⁴ Stephanie Murphy 1stLt USMC, *Fight and Deliver: 31st MEU, USS America ARG build an integrated Blue-Green team*, (Camp Hansen Okinawa, 2020), <https://www.Marine.mil/News/News-Display/Article/2393837/fight-and-deliver-31st-meu-america-arg-build-an-integrated-blue-green-team/>

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