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The Pacific Campaign of World War II provides multiple lessons that apply to today's Marine Corps as it works through the myriad of problems outlined in the Marine Corps Operating Concept 2025: How an Expeditionary Force Operates in the 21st Century (MOC). One of the issues not listed in the current operating concept belongs to Marine Corps Aviation and the Aviation Ground Support units that provide the enabling functions, allowing Aviation to project power. Currently, the Aviation Ground Support units do not have the proper doctrine, equipment set and manpower to fully enable the F-35. The F35 is Aviation's bid for success as they support the MOC; without the F35, the MOC is unsupportable by Marine Aviation.

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Marine Aviation: Enabling the Implementation of Marine Corps Operating Concept (MOC) 2025

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
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Table of Contents Page

EXECUTIVE SUMMARY

Title: Marine Aviation: Enabling the Implementation of the Marine Corps Operating Concept 2025

Author: Major Duane H. Kortman Jr., United States Marine Corps

Thesis: An analysis of the changes and accommodations of doctrine, equipment and structure during the interwar period leading up to the World War II Pacific Campaign offers insights and solutions to current problems to bring Marine Aviation in line with the 2025 vision outlined in the MOC.

Discussion: History provides continuous lessons learned that are regularly applicable to current times. The Pacific Campaign of World War II provides multiple lessons that apply to today's Marine Corps as it works through the myriad of problems outlined in the *Marine Corps Operating Concept 2025: How an Expeditionary Force Operates in the 21st Century* (MOC). One of the issues not listed in the current operating concept belongs to Marine Corps Aviation and the Aviation Ground Support units that provide the enabling functions, allowing Aviation to project power. Currently, the Aviation Ground Support units do not have the proper doctrine, equipment set and manpower to fully enable the Joint Strike Fighter (F35). The F35 is Aviation's bid for success as they support the MOC; without the F35, the concepts outlined in the MOC are unsupportable by Aviation.

Conclusion: The Marine Corps' ability to create a new doctrine, acquire the required equipment set to enable that doctrine, and solve manpower issues in preparation for the Pacific Campaign of World War II is a lesson applicable to the current situation faced by Marine Aviation. Analysis and implementation of the lessons learned and context from the Pacific Campaign of World War II will provide Marine Aviation workable solutions that will enable the F35 in support of the MOC.

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OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE
INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE MARINE CORPS COMMAND AND STAFF COLLEGE OR ANY GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT

Preface

Having just spent three years at Headquarter Marine Corps Aviation working as one of two Marines advocating on behalf of the Aviation Ground Support (AGS) units, I discovered significant problems and inconsistencies in our preparation for the Marine Corps Operating Concept 2025. Additionally, I have been a part of an AGS unit on multiple occasions in my career. These two reasons are a driving force behind this paper, but most of all this paper is really about highlighting my shortfalls as an advocate. In no way is this paper an effort to discredit the work these units put in every day, nor does it attempt to say that when the balloon goes up they will not get the job done. Instead, it highlights a few areas where improvement will lessen the blow of the next significant conflict and it presents historical examples to show what getting things in order before the next war would look like. I hope that current leadership will consider what is written here and be open to discussion if that option becomes available. Finally, this paper does not attempt to prove that I am a subject matter expert on the Joint Strike Fighter (JSF); instead, the platform is used as a key point of friction when it comes to work that needs to be done by the Enablers Branch in support of the AGS units.

I would like to thank Major Blair Faulk for his friendship and motivation throughout this entire year. It would have been a completely different year without him on my team. I must thank my wife for her guidance and friendship, and my daughters who were patient with me throughout this academic year. Additionally, I must acknowledge and thank my Civilian Faculty Advisor, Dr. Lon Strass, and Dr. Linda Di Desidero, from the Leadership Communication Skills Center, for their assistance and guidance throughout this process.

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Introduction

In 2016 General Robert B. Neller, current Commandant of the Marine Corps, published Marine Corps Operating Concept (MOC) 2025 outlining the Marine Corps' 21st-century goals. In this concept, General Neller addresses the Marine Corps' need to "recognize the challenges of the future and develop an operational approach to fight and win."[1] An integral part of Marine Corps Aviation's future approach to operations in support of the MOC is the Joint Strike Fighter (F35). The F35 is Marine Aviation's new technology and will serve as the replacement for the AV8-B Harrier and F/A-18 as the only strike fighter platform.[2] The F35 achieved initial operating capacity in 2012 and will become fully operational capable in 2031.[3] The F35 is Aviation's bid for success in supporting the MOC; however, it is unclear whether the Aviation Ground Support (AGS) units (enablers) can support it.

The AGS community is currently at a pivotal point of change. Just like the Marine Corps after World War I, the organization is looking at its future mission for a next possible war. During the 1920s, the Marine Corps found itself committed to the Banana Wars, fighting guerrillas in Haiti and Nicaragua.[4] Though they were in the midst of ground wars that pushed them in the direction of being a second (land) army, there was a larger and potentially more important mission to US national security outlined in the

[1] Headquarters US Marine Corps, *Marine Corps Operating Concept 2025: How an Expeditionary Force Operates in the 21st Century*, Operating Concept 2025. (Washington, DC: Headquarters US Marine Corps, September 2016), i.
[2] Headquarters US Marine Corps Aviation), *2015 Marine Aviation Plan*. (Washington, DC: Headquarters US Marine Corps Aviation September 2017), 54.
[3] *Ibid*.
[4] Allen Reed Millett, *Semper Fidelis: The History of the United States Marine Corps.*(New York: The Free Press 1990), 206.

1921 US war plan - War Plan Orange.[5] The plan became the *ends* that the Marine Corps focused its efforts upon in order to remain a separate relevant service. By implementing changes in doctrine, equipment, and structure, the Corps ensured its relevancy and war-fighting focus for national security and defense. From the doctrinal writings of Major Pete Ellis to Major Krulak's efforts in the acquisition of a suitable amphibious landing craft, along with General Lejeune's reorganization of the Corps into an expeditionary naval arm, everything the Marine Corps focused on supported War Plan Orange.[6]

Similar to how War Plan Orange motivated interwar thinking, *The Marine Corps Operating Concept 2025* (MOC) is an equivalent motivator to today's enablers. The Marine Wing Support Squadron (MWSS) is the critical Aviation enabler that will ensure the F35 is able to take the fight to the enemy when tasked. However, it is questionable whether Marine Aviation will be able to man, train or equip the force to meet the requirements of the F35 and equivalently the MOC with the current enablers available. Current AGS doctrine, equipment, and structure are not positioned to meet the future Marine Corps mission as outlined in the MOC. An analysis of the changes and accommodations of these elements during the interwar period leading up to the World

[5] Williamson Murray and Allan R. Millet, *Military Innovation in the Interwar Period* (New York: Cambridge University Press, 1996), 57. War Plan Orange formed the basis of the US strategy in the Pacific campaign of World War II. Some of the major elements of War Plan Orange were island hopping, seizure and establishment of intermittent island bases as stepping stones to the next base, bypassing of the enemies strong points and amphibious warfare of the US Marine Corps.

[6] Williamson Murray and Allan R. Millet, *Military Innovation in the Interwar Period* (New York: Cambridge University Press, 1996), 57.
Tony Perry, "Victor H. Krulak dies at 95; retire Marine Lieutenant General," *Small Wars Journal (blog),* Dec 31, 2008, http://smallwarsjournal.com/blog/lieutenant-general-victor-h-krula-updated/. Major Victor H. Krulak was a 1934 US Naval academy graduate and eventually promoted to Lieutenant General. He was the author of *First to Fight* and the father of the 31st Commandant of the Marine Corps, Charles C. Krulak. V. H. Krulak commanded 2nd Parachute Battalion, 5th Marine Regiment, Marine Corps Recruiting Depot San Diego, and Fleet Marine Force, Pacific. V. H. Krulak was born in 1913 and lived to be 95 years old and is buried in the Fort Rosecrans Cemetery in San Diego, CA.

War II Pacific Campaign offers insights and solutions to current problems to bring Marine Aviation in line with the 2025 vision outlined in the MOC.

The Problem with Current AGS Doctrine

AGS doctrine is only able to fulfill portions of the MOC, but not the full concept because it lacks the doctrine, personnel, equipment and training to support the distributed operational capability of the F-35. Despite the fact that (AGS) has been rewriting this outdated doctrine for the last six years, it is still a misrepresentation of current capabilities. It does not consider the F35 and the increase in complexity that platform brings as it relates to AGS operations. Specific examples that do not appear in the new rewrite include the increased security posture of a forward operating base or forward arming and refueling point due to the introduction of SECRET information collected by the F35 during missions. Base security operations are a one of the eleven functions of an AGS unit and are instrumental to the function of Marine Aviation in support of the Marine Air-Ground Task Force.[7]. The F35's sensitivity to foreign objects or debris (FOD) and the consequent activities required to reduce FOD-induced mishaps also does not appear in the new version of AGS doctrine. Marine Aviation has labeled the F35 as a platform that creates a substantial amount of FOD.[8] The omittance of a discussion of AGS tasks in support of the MOC in the current rewrite of Aviation Ground Support is a doctrinal shortfall, which may leave Marine Aviation unprepared to support General

[7] Headquarters US Marine Corps. *Aviation Ground Support.* MCWP 3-21.1. (Washington DC: Headquarters US Marine Corps, October 16, 2001), 1-8. The old publication lists 14 functions of AGS, whereas the new version will only list 11. The new version of *Aviation Ground Support* is going to be MCTP 3-20B instead of MCWP 3-21.1. This follows a directive published by Combat Doctrine Directorate inside of Marine Corps Combat Development Command. This doctrinal shortfall also plays out as a capacity or manpower shortfall as well and will be discussed at greater lengths later in this paper.

[8] This increase in debris on a runway or on a landing pad (due to the F35) equates to an increase in work load and highlights an equipment shortfall that will be discussed in another section.

Neller's 2016 operating concept.[9] To close the gap of the shortfalls within doctrine, AGS can analyze how the interwar period Marine Corps made changes to doctrine in order to accommodate the vision of War Plan Orange. General Lejeune made doctrinal changes based on Major Ellis's writings and research that resulted in the *Tentative Landing Manual*. These changes that improved combined arms, and implementation of forward resupply bases as doctrine are relevant examples. Those changes proved successful to the future of the Marine Corps.

Changes Made in Doctrine During the Interwar Period

In an effort to support the larger and potentially more important mission to US national security outlined in War Plan Orange and to remain a separate relevant service, General Lejeune utilized the research and writings of Major Pete Ellis. Ellis' report *Operation Plan 712D "Advanced Base Force Operations in Micronesia* which outlined the necessity for assaulting and seizing bases needed to project the fleet across the Pacific. He went into detail with hand-drawn schematics outlining the manpower and weapons needed to defeat the Japanese. He also described the environment, enemy, and their offensive and defensive styles. Ellis elaborated on the training required to complete the mission and specific (preferred) landing sites based on the coral reef formations and possible enemy defenses at each location.[10]

The specific details of Ellis' report gave the Marine Corps the direction needed to create the outline for an amphibious doctrine that supported General Lejeune's vision for

[9] Headquarters US Marine Corps, Marine Corps Operating Concept 2025: How an Expeditionary Force Operates in the 21st Century, Operating Concept 2025. (Washington, DC: Headquarters US Marine Corps, September 2016).
[10] Commandant of the Marine Corps. *712H Operation Plan: Advanced Base Operations in Micronesia 1921*. FMFRP 12-46 (Quantico, VA: Marine Corps Combat Development Command, August 21, 1992), 2.

the Marine Corps. The Marine Corps put it to the test in a joint training exercise with the Navy. In 1922, a reinforced regiment of Marines participated in fleet maneuvers with the Atlantic Fleet and produced a laundry list of after action items. In March of the next year and again in early 1924, regimental size landings occurred in Panama, Cape Cod, and the island of Culebra. Not only did significant experimentation occur with landing craft, but the Marines also continued to identify numerous shortfalls such as the lack of attacking forces and order in the landing party, superficial naval bombardment, and poor judgment in the stowage of supplies and equipment aboard ship.[11]

With Major Ellis's doctrinal outline along with the testing and evaluation that occurred in the early 1920s through the landing exercises, Lejeune's successor as Commandant, Major General Ben Fuller, turned his focus on producing a detailed textbook on amphibious doctrine.[12] In 1931, Fuller tasked the staff and students of Quantico Schools with creating the document. The result was the *Tentative Manual for Amphibious Landings*, the most detailed and comprehensive doctrine produced to date highlighting the requirements and issues that Marines and Navy would encounter during an amphibious operation.[13] To test the new manual, the Marine Corps and the Navy began conducting fleet landing exercises again. These exercises, conducted on an annual basis, allowed the Marines to validate the doctrine and identify the requirement for changes and new equipment. In 1938, after multiple exercises, the Navy published the *Tentative*

[11] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., *History of US Marine Corps Operations in World War II*, (Nashville, TN: The Battery Press, Inc, 1993), 10.
[12] Williamson Murray and Allan R. Millet, *Military Innovation in the Interwar Period* (New York: Cambridge University Press, 1996), 75.
[13] *Ibid*.

Manual as official doctrine under the title Fleet Training Publication No. 167, *Landing Operations Doctrine, US Navy*.[14]

After the publication of the *Tentative Manual*, the Commandant made combined arms coordination and execution a priority during all landing exercises. During the testing of the amphibious doctrine, the Marine Corps identified significant issues with combined arms in support of the landing force. It was determined to be successful: the landing force depended on the efficiency and effectiveness of the Navy and Marine Corps joining their firepower together against the defended forces. The fleet landing exercises became the venue to work out the details and coordination of the combined arms requirements, and in the 1940 exercise the Marines found a workable solution for some remaining technical issues. With the technical aspects solved, the Marines were now able to plan for tactical fires, enabling the landing force to move forward with a pre-planned target list that allowed them to request, receive, and adjust timely fire support.[15]

The final major doctrinal change, influenced by the writings and research of Major Ellis and the vision of General Lejeune, was the use of forward resupply bases. These bases extended the time the Navy fleet operated in the combat zone by allowing the Fleet to spend less time transiting to the attack. The establishment of these bases was strategic in regards to location and provided all classes of supply for troops, ship maintenance areas through floating docks, and a place for service members to rest and

[14] Victor H. Krulak, *First to fight: an inside view of the US Marine Corps* (Annapolis, MD: Naval Institute Press, 1999), 82, 90-102.
[15] LCDR D.L. Nutter, *Gunfire Support in Fleet Landing Exercises*, Report prepared for the Atlantic Squadron Commander, September, 1939.

refit. The utilization of these resupply bases was a key component to the Pacific Campaign and the eventual surrender of Japan in September of 1945.[16]

How the Past is Applicable to the Future

By understanding how the interwar Marine Corps created this new doctrine, the lessons learned and knowledge gained during the process provides current leadership a starting point in figuring out the way-ahead in supporting the MOC. The cyclical process of writing new doctrine, testing that doctrine during exercises and then fine-tuning the doctrine based on after action reports is essential to ensure mission readiness when Marines are called upon to fight.

Revisiting the origination of the amphibious doctrine created in part by Major Pete Ellis, finalized and tested by the Quantico Schools, and landing exercises of the late 1930s and into 1940 will aid Marine Aviation Leadership in the task of either validating the current doctrine or creating new doctrine in support of the MOC. In support of the MOC, Marine Aviation will likely be utilizing locations outlined in Major Ellis' plan such as Ulithi, Kwajalein, or Eniwetok to construct EABs whether it is for a short period (72 hours), or a more extended period like the example provided by the Ulithi Atoll.[17] By studying the selection, the buildup and the employment of these forward resupply bases, Aviation leadership will have a good starting point in creating and or evaluating current doctrine against this type of operation. The true test is an honest evaluation when examining current doctrine against the MOC.

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[16] Rolfe H. Hillman III, "They Came To Ulithi." *Marine Corps Gazetet* 78, 11 (November 1994): 82.
[17] *Ibid*, *83*. The islands of Kwajalein and Eniwetok are part of the Marshal Islands located in the Pacific Ocean, to the West of the International Date Line. Ulithi Atoll is further West of the Marshal Islands and is part of the Caroline Islands.

The constant scrutiny and rewriting of the amphibious doctrine ensured the Marines were ready when needed in a wartime situation. Ensuring all details are considered and included in the doctrine is vital for Marine Aviation to grasp to move forward as they figure AGS support to Aviation Operations in support of the MOC. As Marine Aviation develops the employment tactics of the F35 and supports it with sound AGS doctrine, they must follow examples provided during the fleet exercises to allow the units the ability to flesh out any issues with the application. Arguably conducting exercises like the ones executed in the Interwar Period will prove to be a monumental task because of budget restraints and the stove piping across the Services that occurs in today's military, but Aviation leadership has some flexibility. Specifically, the exercises conducted at Marine Aviation Weapons and Tactics School are an example that may offer some of the required testing of the new doctrine. Current Marine Aviation leadership should re-establish the baseline in AGS doctrine and make it coherently linked to Aviation doctrine. By doing so, this will put the enablers in a better position to execute the mission of the MOC and enable Marine Aviation across the entire range of military operations. It will allow flexibility in operations and create ease of maneuver when an inevitable deviation is required.

Current AGS Equipment Shortfalls

If the F35 is Marine Aviation's bid for success in the future, it will need to be able to take off and land not only from the deck of the Navy's ships, but from forward operating bases in austere conditions. However, current testing shows that the engine of the F35 is highly susceptible to FOD, reducing the number of expeditionary landing for

the aircraft.[18] AGS units, those tasked with reducing FOD in support of Forward Arming and Refueling Points (FARPs) or main air base activities, cannot conduct the proper FOD removal needed in support of the susceptible engines of the F35 due to a lack of a reliable, deployable (expeditionary) runway sweeper. The current runway sweeper was part of an abbreviated acquisition process in 2004 that lacked a thorough examination of the expeditionary requirements and employment demands on the sweeper.[19] Unless the procurement of a runway sweeper happens, the AGS units will be unable to perform the sweeping operations they conduct at FARPs and main air bases and the F35 will be ineffective due to lack of proper support.

The current runway sweeper is old, maintenance intensive, and unable to produce a clean surface able to support F35 operations in an expeditionary environment. Additionally, because the sweeper is not a program of record within the Marine Corps family of vehicles, obtaining parts and maintenance of the sweeper is not conducive to the activities looming in the future in supporting the MOC.[20] Testing and reports from exercises conducted on the West Coast highlight these facts and issues currently facing Marine Aviation.[21] The Aviation Enablers Branch at Headquarters Marine Corps Aviation, Marine Corps Engineer Schoolhouse and the Logistics Integration Department at Marine Corps Combat Development Command are currently examining this equipment

[18] Headquarters US Marine Corps Aviation, *AGS OAG F35 Working Group 2017 Out-Brief*. (Washington DC: Headquarters US Marine Corps, May 9, 2017), 6-11.
[19] Headquarters US Marine Corps Aviation, *Expeditionary FOD Mitigation Working Group Kick Off Meeting Out-Brief*. (Washington DC: Headquarters US Marine Corps. January 25, 2018), 4.
[20] *Headquarters US Marine Corps Aviation, AGS OAG F35 Working Group 2017 Out-Brief. (Washington DC: Headquarters US Marine Corps, May 9, 2017),* 10. These two out-briefs highlight the lack of a current expeditionary FOD mitigation capability with the AGS community. The current runway sweeper is past its 10 year service life and is highly maintenance intensive, does not adequately reduce FOD in an expeditionary environment and is causing a safety of flight issue for Marine Aviation.
[21] *Ibid*.

shortfall. A historical study of the long struggle faced by the Marine Corps and Navy to develop a suitable landing craft during the 1920s through the 1940s can be a starting point and good historical reference from which a new sweeper can be developed and procured.

A Study of the Landing Craft Vehicle Personnel (LCVP)

Although the concept of advanced based forces had been around since 1900, in 1913 the Navy had only built six unpowered artillery lighters, and by 1923, in addition to those six lighters, the Navy had only one amphibious landing craft.[22] The "Beetle" or "Kelley Cole" was as an experimental ship fifty-five feet in length with twin engines, a wooden hull, and a steel canopy on top designed to shield the passengers from small arms fire.[23] By all accounts, the steel canopy was not able to protect troops from small arms fire and, in fact, acted as a trap or barrier that kept the troops inside during a capsizing event. Additionally, the boat lacked surf capability, was very difficult to maneuver and had zero capability to haul or transport motor transport equipment.[24]

Over the next ten years the Navy and Marine Corps battled at the highest levels of command – Headquarters Marine Corps in Washington, D.C. – to move amphibious landing operations toward a complete and executable plan. Just as Headquarters for both the Navy and Marine Corps are battling today, in the 1920s and 1930s both sides were struggling with tight budgets and a battle for what program would reduce the greatest risk to national security and therefore get funding. In September of 1937, Lieutenant Victor

[22] Victor H. Krulak, *First to Fight: An Inside View of the US Marine Corps* (Maryland: Naval Institute Press, 1984) 88. Lightering is the use of small craft designed to transport cargo or personnel from ship to shore. Lighterage includes amphibians, landing craft, discharge lighters, causeways, and barges. This definition can be found in the 2005 version of the Dictionary of Military and Associated Terms produced by the Department of Defense.
[23] *Ibid.*
[24] *Ibid,* 89.

H. Krulak and the Marine Corps got a much-needed break. The Marine Corps, the Navy, and even the Japanese agreed to allow Krulak to observe a Japanese amphibious assault on Chinese positions located in the Liuho area near the mouth of the Yangtze River.[25] To Krulak's surprise, the Japanese allowed the United States to observe and take pictures of the landing craft the Japanese were employing and observe the way combined arms protected the advance of the landing craft. In Krulak's mind, what he observed was what the Marine Corps needed, both in the ships used, and the flow of the operation itself. Krulak immediately wrote a report that included the pictures of the landing craft and sent it to Headquarters outlining his observations and recommendation that the type of boat described in his report should be what Headquarters pursued.[26]

Despite the efforts of Krulak and the report sent to headquarters, the Navy failed to take direct action, resulting in a stalemate in the effort to find a solution or a boat similar to the one Krulak had described in his report.[27] Despite inactivity from the Navy, the Marines took steps to solve the ship to shore issue by creating a thirty-foot boat designed to carry tanks and heavy equipment that failed under live testing during landing exercises in 1936.[28] In 1938 and 1939, at the request of the Marine Corps, the Navy built three boats, all capable of carrying one tank, but that design also failed during testing in 1940.[29] General E.P. Moses and Major E.E. Linsert of Marine Corps Equipment Board eventually found the answer through a relationship that began in 1934, with Andrew

[25] Victor H. Krulak, *First to Fight*: *An Inside View of the US Marine Corps* (Maryland: Naval Institute Press, 1984), 90.
[26] *Ibid*, 91.
[27] *Ibid*.
[28] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., *History of US Marine Corps Operations in World War II*, (Nashville, TN: The Battery Press, Inc, 1993), 24.
[29] *Ibid*.

Jackson Higgins.[30] Higgins owned a boat building company in Louisiana and created a boat used by rum-runners, trappers and oil rig workers that allowed for easy access to the shores of the Mississippi River regardless of the tidal conditions.[31] Over a period of five years the Marine Corps, Higgins and, hesitantly at first, the Navy worked out the details for a thirty-six-foot ramp-bow landing craft suitable for amphibious operations.[32] This craft became the Landing Craft Vehicle, Personnel (LCVP), with the first model delivered to the Marine Corps for testing in 1941[33]

With the procurement of a new landing craft, the Marines were now able to effectively and efficiently shuttle combat power ashore. The next sensible step was to create a tactic that aided in the correct sequencing of required combat power. Thus, the tactic of combat loading was adapted, revised and taught to the entire Marine Corps to ensure the uniformity of logistical support that phased combat power ashore. The idea of combat loading is not necessarily a new tactic, but to meet the demands of amphibious doctrine, the Marines spent time in the landing exercises in the middle of the 1930s getting it right. Originally combat loading had been labeled simply as embarkation, or the action taken to load all the required personnel and equipment aboard a vehicle to deliver it to a certain location at a certain time. From the lessons learned at Gallipoli or those from the British invasion of Norway, the Marines were able to move forward from the

[30] Victor H. Krulak, *First to Fight*: *An Inside View of the US Marine Corps* (Maryland: Naval Institute Press, 1984), 92.
[31] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., *History of US Marine Corps Operations in World War II*, (Nashville, TN: The Battery Press, Inc, 1993), 24. Victor H. Krulak, *First to Fight: An Inside View of the US Marine Corps* (Maryland: Naval Institute Press, 1984), 92
[32] *Ibid*, 28.
[33] Victor H. Krulak, *First to Fight: An Inside View of the US Marine Corps* (Maryland: Naval Institute Press, 1984), 95.

simple mindset of just loading everything into the ship to having a well thought out plan instead.[34]

In 1940 this well thought out and synchronized plan became known as the combat loading standing operating procedure (SOP), and Brigadier General H. M. Smith, Commander of 1st Marine Brigade, made it the SOP for all battalions serving under his command. When General Smith became the first US commander of the amphibious force in the summer of 1941, the new SOP became policy Marine Corps-wide. In February of 1942, an official school began operating aboard Quantico: the Transport Quartermaster (TQM) section of Headquarters Marine Corps. This school took responsibility for the curriculum and conduct of the classes.[35]

The instruction of combat loading taught at the Quantico Schools entailed a combination of tactical and commercial shipping theories. The tactical portion of the theory stemmed from the actions planned for execution when combat power reached the shore and began moving to its assigned objective. Basically put, the tactical plan on the ground drives the tactical loading of the ship; the two elements should be in synch and mutually supporting. This process is required to ensure adequate supplies and equipment is available to the assault troops in the exact order it is required.[36] The experiences that General Smith's Battalion Commanders gained from landing force maneuvers off

[34] Colonel Ransom Wood, "Embarkation-The Second Phase," *Marine Corps Gazette* 45 June (1955); 39, 6 Quintin Bradley, "Why at TQM," *Marine Corps Gazette* (pre-1994); (Dec 1947); 31, 12; Military Database, 26.
[35] SSgt Bill Miller, Moving Combat Cargo, *Marine Corps Gazette (pre-1994);* 47. February 1945; 29, 2; Proquest.
[36] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., *History of US Marine Corps Operations in World War II,* (Nashville, TN: The Battery Press, Inc, 1993), 19.

Culebra Island in 1935-37 and the theories utilized at the Quantico School in building the SOP made up the backbone of the combat loading theory.[37]

The second part of the theory comes from the commercial shipping approach, which calls for the utilization of every cubic foot of storage space aboard the main ships as well as the amphibious landing craft. The education provided at Quantico by the TQM section covered the layout of all the ships and landing craft and the size and weight of the Marines and associated gear. As the qualified TQM students left school, they were assigned to particular ships and through hands-on experience in testing and exercises had to become familiar with the forces assigned and the associated gear and equipment.[38] The ability of the TQM to rapidly learn the characteristics of the assigned ship and associated gear proved crucial in increasing the efficiency of the offload, to keep the Navy from sitting in striking distance of the enemy. The training aboard Quantico and the individual TQM teams aboard each ship became a vital part of combat loading and the success of amphibious landings conducted by the Marine Corps.

How Does AGS Find the New Runway Sweeper?

During the testing of the landing craft, many lessons can be identified that can be used as a catalyst for today's pursuit of a suitable runway sweeper. The lesson learned in the case of the LCVP began with the realization that there was a problem with ship to shore landings. Similarly, AGS has identified the need for an upgraded, deployable sweeper to facilitate F35 operations in an austere environment. The diligent manner in which General Krulak found a suitable landing craft to fit the mission and then get the

[37] SSgt Bill Miller, Moving Combat Cargo, *Marine Corps Gazette (pre-1994);* 47. February 1945; 29, 2; Proquest.
[38] *Ibid.*

right individuals involved to secure the rights to procure that vehicle is another lesson. Immediately, Aviation leadership can design competitions in search of new runway sweeper designs and open it up to Marines, universities, and the industry with the promise of the contract award given to the winner.[39] If none of the concepts produced work, Marine Aviation leadership will have to continue the search until the right piece surfaces. Aviation leadership will find the solution for the current runway sweeper issues through diligence just as Krulak did.

When Marine Aviation leadership finds the new runway sweeper it can begin the procurement process underway, and the creation of an updated SOP. The work outlined by the Quantico schools and TQM section of Headquarters Marine Corps would be a good starting point for Marine Aviation Leadership to begin putting together the right information needed to employ the sweeper. The Marine Aviation Enabler community--through the operational advisory group (OAG), the Marine Corps Engineer School and select units from Marine Operational Forces--can (and will) build the proper SOP. Testing the SOP during exercises, addressing after action reports with rewrites, and then testing it again will ensure that, when the equipment is needed in support of the F35, it is used properly. By identifying the need for a new runway sweeper and taking lessons learned from the creation and acquisition of the LCVP, Marine Aviation can ensure the F35's ability to support the Marine Rifleman on the ground. If the process of acquiring a new runway sweeper is completed correctly and before the new war, the history books of

[39] US Department of Defense. Joint Capabilities Integration and Development System Manual. (Washington DC: Office of the Chairman of the Joint Chiefs of Staff. February 2015). JCIDS will determine what acquisition activities are legal; the process must be adhered to.

that war will read much like the history of the Marines during the march up to Baghdad in Operation Enduring Freedom I.

Current AGS Manpower Issues

To focus the efforts of Marine Corps leadership on the current Marine Corps manpower issues, General Neller created the Future Force 2025 (FF2025) operational planning team (OPT). This OPT would determine the application of the current manpower end strength to maximize employment in supporting the MOC. Before the kickoff of the FF2025 OPT in 2015, General Neller stated: "…currently our force is not properly manned, trained, or equipped to meet the needs of future conflict."[40] In support of his statement, all recent accounts of historical evidence with regards to growth in manpower across the Marine Corps shows today's end strength of the Marine Corps is not getting any bigger and if history tells us anything, it may reduce. This is especially true for AGS units where reductions to the Marine Aviation Enablers persist in the Force Structure Review Group outputs, Commandant directed boards, and OPTs such as the FF2025 OPT.

The Creation of the Fleet Marine Forces

Whether it is the loss of all three Marine Wing Support Groups, the loss of a command in Beaufort, SC, or the steady decline of capacity from all the AGS units, the fight for manpower will continue to be an battle that the AGS units will need to fight.[41]

[40] Commandant of the Marine Corps. T*he Marine Corps Operating Concept: How An Expeditionary Force Operates in the 21st Century*. (Washington DC: Headquarters US Marine Corps, September 1, 2016), 8.
[41] Commandant of the Marine Corps. *Reshaping America's Force In Readiness: Report of the 2010 Marine Corps Force Structure Review Group.* (Washington DC: Headquarters US Marine Corps, March 14, 2011), 6. One of many changes made during 2011 and 2014 FSRG was the loss of three 0-6 level commands from the each of the three Marine Air Wings and in 2014 the loss of an 0-5 level command in Beaufort, SC. The loss of these commands created a significant gap in capability in the AGS community. Specific losses include the loss of command and control of AGS units, the loss in capacity in firefighters, food service technicians, communication technicians and motor transport drivers.

Analyzing the foresight of past leaders such as Lejeune, Ellis, or Russell used in their different challenges can be instrumental in helping Marine Aviation leadership align the current manning within AGS units and help find the correct structure with available forces. Manpower adjustments made by the US in the Pacific campaign of World War II identify the ability of the Marine Corps getting the aviation enablers properly manned before the beginning of the next conflict.

Lejeune understood that for the Marine Corps to remain relevant and in existence, the structure, overall understanding of the mission, and its ability to conduct that mission despite financial and manpower shortages was paramount. Before 1921, when the Expeditionary Force was created at the Quantico Schools, the Corps' organization morphed into an Advanced Base Force (ABF), which through task organization allowed for great flexibility and gave the Corps the ability to accomplish short notice missions with great success. The intent and purpose of the ABF had been to seize and defend advanced bases, in support of the the Naval Fleet.[42] As the Navy worked toward supporting War Plan Orange and reductions to manning continued in the interwar period, Lejeune saw the need to focus the Marine Corps efforts toward support of the Navy[43] Through experiences in World War I, Lejeune knew that the Marine Corps could not sustain itself as a standalone army and instead focused all of his efforts on linking the mission of the Marine Corps to the Navy. The requirement, in Lejeune's mind, was a scalable and mobile force to support the Navy's fleet for operations ashore.[44]

[42] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., *History of US Marine Corps Operations in World War II*, (Nashville, TN: The Battery Press, Inc, 1993), 8.
[43] John A. Lejeune, "The United States Marine Corps," United States Naval Institute Proceedings 51, no. 272 (October 1925): 1862.
[44] *Ibid.*

Lejeune's goal was to cement the Marine Corps as a service of its own, one not tied to the Army. He restructured the headquarters staff by relying on knowledge and experience gained through service with the Army. By restructuring the staff, Lejeune increased the efficiency and effectiveness without the addition of more individuals. He also created additional branches at Headquarters Marine Corps where the Marine Corps needed to focus: on aiding in the recruiting, training, and operations efforts.[45] Lejeune's efforts were instrumental in the creation of the expeditionary force; however, there were not enough forces on hand for his attempt to become a reality.

It was not until January of 1933, when the last Marines departed from Nicaragua and withdrawal from Haiti began that there were enough Marines to see the reality.[46] Assistant Commandant of the Marine Corps (CMC), Brigadier General John H. Russell understood Lejeune's vision of an expeditionary force and re-initiated his vision and efforts. Russell knew the Chief of Naval Operations' (CNO) concerted efforts were to support War Plan Orange and the force Lejeune envisioned would complement the US Navy Fleet perfectly. Russell recommended renaming the Expeditionary Force and put it into service with the Fleet immediately. His recommended name was the Fleet Marine Force (FMF).[47] Under Russell's plan, when underway with the Fleet, the FMF was in direct control of the Naval Fleet Commander and when not embarked or underway, the FMF was under the command of CMC.[48] The CMC and CNO both supported the idea, and the CMC established a guideline for the proposed relationship. On December 8,

[45] Allen R. Millet, *Semper Fidelis: The History of the United States Marine Corps* (New York: MacMillian Publishing Co., Inc., 1982), 323-325.
[46] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., History of US Marine Corps Operations in World War II, (Nashville, TN: The Battery Press, Inc, 1993), 12.
[47] *Ibid*, 13.
[48] *Ibid*.

1933, the Navy issued Department General Order 241.[49] The FMF and its subsequent service as the landing force from Guadalcanal to Okinawa showed tremendous foresight on the part of Lejeune and Russell by creating the requisite force structure to enable the doctrine he created.

The Creation of the Shore Fire Control Party

To ensure flawless landings, the new landing force required a responsible organization for the delivery of fires during amphibious operations. The idea of employing the guns of naval vessels in support of an amphibious force landing on a hostile beach was used many times before. There had been naval gunfire used at Vera Cruz in 1847 during the Mexican War, during the Civil War at Fort Fisher in 1865, at Gallipoli, and in the form and fashion very similar to what the Marines employed at Guadalcanal in August of 1942.[50] The task, of controlling, fires at Guadalcanal and the other examples listed fell on two naval officers appointed by the ship's commander and attached to the Marine Artillery unit. In most cases, these officers did not understand the basics of infantry maneuvers and therefore were unable to conceptualize the fires required to support the advancing infantry.[51] It was not until 1941 that Marine Artillery Officers with associated radios and crewmen became responsible for the task.[52] In the early 1950s, Lieutenant Colonel Donald M. Weller, an imaginative Marine Artillery Officer took lessons learned from previous naval officers who had been appointed the job

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[49] *Ibid*.
[50] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., *History of US Marine Corps Operations in World War II*, (Nashville, TN: The Battery Press, Inc, 1993), 16.
Oldfield, William B. 1945. "Shore Fire Control Parties." *Marine Corps Gazette* (Pre-1994) 29 (11): 53-54. https://search-proquest-com.lomc.idm.oclc.org/docview/206264737?accountid=14746
[51] *Ibid*.
[52] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., *History of US Marine Corps Operations in World War II*, (Nashville, TN: The Battery Press, Inc, 1993), 16.

and melded them together with his ideas to outline the idea of creating a specific team for controlling the supporting fires: the creation of the Shore Fire Control Party (SFCP).[53] Weller's efforts were implemented during the battle of Iwo Jima where the SFCP made its worth felt as one Marine division's SFCP fired over one thousand missions in support of operations. The actions by this team were more than double of that by any SFCP in the history of amphibious operations.[54] Current AGS advocates should examine whether the personnel assigned to tasks are fully prepared to fulfill those duties. Where applicable, changes should be made and task organized units such as the SFCP created to accomplish specialized tasks.

Manpower Adjustments in the Shore Party

Another informative example of the Marines building capacity or capability from within a standing organization is the adjustment of manpower to the shore party. The shore party's mission enabled the throughput of forces and supplies on a beachhead after a landing force landed. During the fleet exercise of1941, Major General H.M. Smith--who was the landing force commander for the New River, NC, exercise--identified multiple issues with the activities at the beachhead with regards to the throughput of troops and supplies.[55] The lack of personnel within the shore party was the main issue, along with command and control of the party. In the manpower structure witnessed by Smith, the number of the Marines in the Shore Party only had enough capacity to move supplies that would sustain the fighting force for less than three days.[56] Smith made a

[53] Oldfield, William B. 1945."*Shore Fire Control Parties*." Marine Corps Gazette (Pre-1994) 29 (11): 53-54. https://search-proquest-com.lomc.idm.oclc.org/docview/206264737?accountid=14746
[54] *Ibid*.
[55] LtCol Frank Hough, Maj Verle Ludwig, Henry Shaw Jr., *History of US Marine Corps Operations in World War II*, (Nashville, TN: The Battery Press, Inc, 1993), 21.
[56] *Ibid*.

recommendation to sitting Commander in Chief of the Atlantic Fleet, Rear Admiral Ernest J. King, which the Shore Party size increase to meet the demand. Additionally, he requested that the forces must come from the service force and that the command and control of the party resided with the landing force.[57] The result was a decision made by a joint board made up of Navy, Marine, Army and Coast Guard members who decided to side with the recommendation of General Smith. Specifically, the Marine Corps took manpower from within the service and added a pioneer unit labeled 'shore party' to the Marine Division consisting of approximately 700 personnel.[58]

This re-allocation of manpower within the Division/addition of seven hundred personnel to the Division to create the 'shore party' is an extreme example. It is unrealistic to expect that in this day of constrained manpower, that seven hundred billets will be reallocated from other units to create the capacity required to support the F35B. This example is used to highlight the extreme steps that were taken during the interwar period to build needed capacity. AGS advocates should be prepared to thoroughly examine their manpower shortfalls, and request the personnel required to accomplish the mission.[59]

Analysis of Historical Manpower Examples

The creation of the FMF, the SFCP, and the Shore Party showed innovation on behalf of previous leaders. Innovative manpower moves will be a must for Marine Aviation leadership to cover the current manpower gaps within the AGS units. To meet the requirements tasked to Marine Aviation inside of the MOC, there will need to be

[57] *Ibid*.
[58] *Ibid*.
[59] In support of this effort, the logistics OAG should examine the community as a whole, and see where personnel might be shifted from to meet the capability requested by AGS units.

capabilities and specific capacity created from within to overcome lost manpower. With an unlikely increase in the total strength of the Marine Corps and the difficulty of the future operating environment, there is no other option. The ability to create the required manpower exists; current Aviation Leadership has to send the right individuals to the OAG (including those OAGs outside of Aviation), with the proper guidance in hand for this to occur. The leadership must facilitate and foster environments in which out of the box thinkers can bring ideas and theories to the table that realign the manpower where required without increasing the numbers on a table of organization. Registering recommendations that do increase the numbers on a table of organization is also greatly important and relevant if there is an increase in the overall size of the Marine Corps. If the Marine Corps views an increase to manpower on a table of organization as a workable solution that will reduce risk at a pivotal location, it may be beneficial to the success and future of Marine Aviation.

For Aviation leadership to continually stay ahead of the manpower struggle will take great effort up and down the current chain of command. It is imperative that Aviation leadership stays connected and in touch with the realities faced by AGS units tasked with enabling the Air Combat Element. The key take away with manpower is how the loss of manpower (capacity) correlates to mission accomplishment or mission failure. The OAG system is the best tool to recommend and then work toward a solution to the manpower shortfalls, as it takes input from all AGS units and addresses that input accordingly with Marine Aviation Leadership.[60] Marine Operational Forces units need to

[60] Operation Advisory Groups (OAG) are directed by Headquarters Marine Corps to address issues that arise throughout Operational Units and give the Operating Force the ability to directly interact with higher headquarters and those agencies who can and will address shortfalls/gaps/requirements. The current AGS OAG charter consist of membership by the Deputy Commandants for Aviation and Logistics (DCA and

continue to share lessons learned and successes they have in completing tasks with less capacity and ensure they route these lessons properly for the betterment of all units. The linkage between the Aviation OAGs and the Logistics OAGs needs to be areas of significant focus for both parties, as lessons learned apply to both sides on/at multiple levels, and additional manpower may come available if the Logistics community makes internal adjustments.

The creation of the SFCP is an enlightening example for Marine Aviation, one that shows the ability to build a section or capability from available manpower resources and create momentum in the face of a (manpower) gap. Multiple manpower gaps exist in the AGS units where this example is applicable. The loss of the Military Police (MP) is one capability that fits into this category.[61] One of the mission essential tasks assigned to the AGS units is security, at airfields, forward operating bases, and FARPs.[62] One of the only responsibilities of the MPs was to lead the security mission of each of those appropriate tasks. With the manpower gap and the loss of the associated skill set, the Marines of the AGS units will have to continue to find solutions outside of the proper employment of MPs. This capability shortfall is one of many within AGS units; however, just as the capacity to build the capability of the SFCP came from within a standing organization, a solution for the loss of the MPs has to occur. Currently, task-organized teams from within the AGS units are put together to fill this mission. The MPs, if

DC I&L), the current Aviation Ground Support Departments of all three Marine Aircraft Wings, Marine Aviation Weapons and Tactics Squadron-1 AGS cell, Marine Engineer School House and multiple other agencies. The current AGS OAG charter was signed in 2013 by both DCA and DC I&L signaling a commitment to the AGS community.

[61] Headquarters US Marine Corps, *Marine Corps Bulletin 5400: Military Police Company Restructuring*. (Washington DC: Headquarters US Marine Corps, September 2011).

[62] Headquarters US Marine Corps, *Marine Corps Order 3500.26, Marine Corps Task List 2.0*. (Washington DC: Headquarters US Marine Corps, March, 15, 2018). 15.

available, can provide training but that is not always the case as the MPs' overall manpower numbers are at an all-time low. Additionally, there is one infantryman on the table of organization for an MWSS and his sole purpose is to train the entire unit to conduct the security mission.[63] One Marine is not enough to ensure that the correct training of base security is complete or ample. Marine Aviation Leadership has to fill this gap by creating a capability already existent in the organization even if includes pulling manpower from other logistics communities in the Marine Corps to fill the manpower gaps in AGS.

Conclusion

The Pacific Campaign of World War II highlights many examples to aid current Aviation leadership with context and lessons learned to support the implementation of Marine Aviation's portion of the MOC--specifically, the current deficiencies with AGS units. Three sections outline this thesis: one on doctrine, one on equipment and the final piece on manpower. All of the sections and problems presented use a historical approach to provide examples from the Pacific Campaign of World War II for presenting current Aviation leadership with context and lessons learned that are applicable for support to the MOC and current deficiencies in each of the three categories. The creation of amphibious doctrine, the procurement of the LCVP, and the lessons learned about creating capability from within a standing organization all correlate with current shortfalls and deficiencies within the AGS units.

[63] The importance of this Marine on an MWSS table of organization is vitally important to the base security mission assigned to an AGS unit. The infantryman brings the required and requisite knowledge and ability to train and evaluate the unit in preparation and execution of the mission. To make matters worse the infantry community is continually trying to remove this billet off of the MWSS table of organization to fill billet shortfalls elsewhere. Additionally, due to the one up/one down staffing policy a Staff Sergeant usually fills this billet.

The requirement to change first requires admitting the fact that there is a problem (gap) and then requires admitting that there is a problem and then taking action to nullify the problem. General Mattis said during his time as the Commander, Joint Forces Command, "We are not likely to get the future right. We need to be sure we don't get it too wrong."[64] In a 2016 article written for the Association of the United States Army, General Miley, the current Chief of Staff of the Army similarly echoed Mattis' comment about the future by stating, "We have to get it about right…just not as wrong as our enemy."[65] Both comments relate to the capacities of each AGS unit and the ability of the unit to make adjustments to the tasks that lie in the future. These quotes apply to both the enemy and the internal struggles of the organization. The ability for Marine Aviation to meet the requirements of the MOC is possible (and required); however, making adjustments along the lines of doctrine, equipment, and manpower is a must and requires attention soon.

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[64] Mackubin Thomas Owens., Reflections on Future War., *Naval War College Review* 61, 3(July 2008): 74.
[65] General Mark A. Milley, "Changing Nature of War Won't Change Our Purpose ," *Association of the United States Army*, last modified October 1, 2016. https://www.ausa.org/articles/changing-nature-war-wont-change-our-purposes.

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