

# The U.S. Army's Influence on Marine Corps Tank Doctrine

by Major Joseph DiDomenico, USA<sup>1</sup>

Doctrine provides solutions to tactical or operational problems. It is the frame of reference used by soldiers and leaders to organize, train, and fight. Over time, these principles become the paradigm for how units function, enabling troops and commanders to act quickly against foreseeable threats. In November 1943, crisis shifted the doctrinal paradigm for the U.S. Marine Corps at the Battle of Tarawa. When the battle ended, it cost the 2d Marine Division 3,301 casualties in only three days of combat. Armored forces in particular took upwards of 86 percent losses—the result of poor communication, poor planning, and ineffective firepower.<sup>2</sup> The American public demanded that Marine Corps leaders be held accountable for what they considered a catastrophic military failure.<sup>3</sup> Commanding officers in the Fleet Marine Force (FMF) acknowledged improvements must be made to correct the problems encountered on Betio Island, among them the ineffective employment

of tanks.<sup>4</sup> These failures were the catalyst for doctrinal and technological changes that affected future Marine Corps campaigns in the Pacific theater of operations.

After World War I and throughout the interwar period, the leadership of the Marine Corps recognized that armored forces would be an important factor to support the seizure of advanced bases and islands. Of higher priority, however, were developing systems to synchronize naval gunfire and developing an amphibious tractor to land troops.<sup>5</sup> After the outrage over losses during the Gallipoli campaign in 1915, these two problems had to be solved, and they overshadowed the incorporation of tanks into amphibious operations.<sup>6</sup> As a quick and economic solution, the Marine Corps Equipment Board purchased tank technology from the U.S. Army in 1938.<sup>7</sup>

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<sup>3</sup> Derrick Wright, *Tarawa, 20–23 November 1943: A Hell of a Way to Die* (London: Windrow and Green, 1996), 150.

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<sup>4</sup> A. H. Nobel, "Brief Report of Amphibious Operations for the Capture of the Gilbert Islands," 6 January 1943, Record Group (RG) 38, Box 8, National Archives and Records Administration (NARA), College Park, MD; and "Brief on Tarawa Operation," CINCUS Plans Division, 5 December 1943, RG 38, Box 8, NARA.

<sup>5</sup> Kenneth W. Estes, *Marines Under Armor: The Marine Corps and the Armored Fighting Vehicle, 1916–2000* (Annapolis: Naval Institute Press, 2000), 16–17; Jeter A. Isely and Philip A. Crowl, *The U.S. Marines and Amphibious War: Its Theory, and Its Practice in the Pacific* (Princeton, NJ: Princeton University Press, 1951), 23–24; and Victor Krulak, *First to Fight: An Inside View of the U.S. Marine Corps* (Annapolis: Naval Institute Press, 1984), 72–73.

<sup>6</sup> Oscar E. Gilbert, *Marine Tank Battles in the Pacific* (Boston: Da Capo Press, 2001), 16–17.

<sup>7</sup> Chief Ordnance to CMC, 26 April 1938, and minutes of MCEB meeting 31 May 1938, RG 127, Box 76, NARA; and LTC Lemuel C. Shepherd memo to CMC, 31 May 1938, RG 127, Box 154, NARA.

With this procurement of technology, the Army provided the Marine Corps its tactical and organizational doctrine and training at the Army's tank school. The Army's way of armored warfare became the foundation of Marine Corps tank unit structure and education. The Army's armored tactics, however, were not designed to operate in the Pacific theater, where close infantry coordination was necessary, but rather were designed for independent armored formations.<sup>8</sup> The shortcomings of the Army's tank doctrine to support the seizure of advanced bases resulted in a dramatic resource- and casualty-intensive progression of Marine Corps tank doctrine throughout operations in the Pacific theater that started at the Battle of Tarawa.

At the start of fighting in the Pacific, Marine Corps doctrine regarding the role of tanks in an amphibious assault—outlined in the *Tentative Landing Operations Manual* of 1934—was vague.<sup>9</sup> As a result, the first Marine tank crews were trained to operate in independent armored formations. Army units were organized into units that extended from the four-tank armored platoon up to an entire armored division, as dictated by the recently published Army doctrine. This tactic was designed for Army units fighting in the terrain of Europe and North Africa, where an enemy armored threat was more prevalent. The Marine Corps later recognized that independent tank operations in restricted island terrain against an entrenched enemy was fatal for many tankers. During the Battle of Tarawa, coordination between infantry and armor was essential to survival. It forced the Marine Corps to modify its tactics and techniques. Tarawa, therefore, became the single point at which the Marine Corps' doctrine and principles of tank warfare began to develop differently from the Army's concept of armored warfare.

This article discusses how Army technology pur-

chased by the Marine Corps Equipment Board in 1938 hastily forced the Corps to also implement tank doctrine on Army operational principles. The actions of Marine Corps units in the central Pacific campaign are used as the sample for this assessment. This selection, while small, allows us to consider the effects of armor doctrine at every echelon of tactical command from the company level to the FMF by reviewing ad hoc lower-level adjustments to doctrine from the platoon to the battalion.<sup>10</sup> From the regiment to the division, administrative standard operating procedures (SOPs) were established by the command to offset unclear or ineffective procedures.<sup>11</sup> Above the division, organizational change was codified by the Marine Corps in the wake of the significant public pressure as a result of losses at Tarawa. This is seen in unit tables of organization and the tactical field manuals that were codified at the Tank Matters Conference in 1945.<sup>12</sup>

## Context: The Interwar Period

By the close of World War I, the methods used to wage war were dramatically different than in previous

<sup>10</sup> Bale, "Edward Bale Oral History Interview"; and "Special Action Report of the Second Tank Battalion, from CO 2nd Tk Bn to CG 2nd Mar Div," 14 December 1943, RG 127, Box 70, NARA.

<sup>11</sup> R. M. Pate, enclosure A in report of conference, FMF PAC [Pacific] draft SOP Tank-Infantry Coordination, RG 127, Box 18, NARA; and FMF PAC draft SOP Tank-Infantry Coordination, RG 127, Box 18, NARA.

<sup>12</sup> Report of conference for C/S FMF PAC, 3 May 1945, Conference on Tank Matters, RG 127, Box 18, NARA; R. K. Schmidt, report of conference for C/S FMF PAC, 3 May 1945, Conference on Tank Matters, RG 127, Box 18, NARA; R. L. Hall, memo for Tank Conference Report, 8 June 1945, RG 127, Box 18, NARA; USMC T/O E-80, Tank Battalion, Marine Division, approved 15 April 1943, Subject Files: Tables of Organization, (E-80), Historical Reference Branch, Marine Corps History Division, Quantico, VA; USMC T/O F-80, Tank Company, Marine Division, approved 4 May 1944, Subject Files: Tables of Organization, (F-80), Historical Reference Branch, Marine Corps History Division; USMC T/O G-76, Tank Company, Marine Division, approved 1 May 1945, Subject Files: Tables of Organization, (G-76), Historical Reference Branch, Marine Corps History Division; USMC T/O G-80, Tank Company, Marine Division, approved 1 May 1945, Subject Files: Tables of Organization, (G-80), Historical Reference Branch, Marine Corps History Division; and Amphibious Operations, Employment of Tanks, Phib 18, 1948, HAF 234, Archives Branch, Marine Corps History Division.

<sup>8</sup> Jon T. Hoffman, ed., *A History of Innovation: U.S. Army Adaptation in War and Peace* (Washington, DC: U.S. Army Center of Military History, 2009), 53–55.

<sup>9</sup> *Tentative Landing Operations Manual* (Quantico, VA: Marine Corps Schools, 1934), Historical Amphibious File (HAF) 39, Archives Branch, Marine Corps History Division, Quantico, VA.

conflicts. New technologies and capabilities like the tank, aircraft, accurate indirect fire, and new mechanized lift capabilities as well as the scope of how units organized, trained, and deployed were undergoing a revolutionary change. Synchronization and combined arms became foundational elements for wargames and exercises executed during the interwar period.<sup>13</sup>

Limitations, however, plagued the use of tanks during World War I, particularly speed and the considerable amounts of maintenance and logistics support required to ensure they were operational.<sup>14</sup> Despite these shortcomings, there remained a lot of potential for the tank in battle. Its primary role was as an infantry support vehicle that had heavy and light capabilities. Light tanks boasted more maneuverability and speed and therefore offered the ability to exploit weaknesses in enemy lines quickly. Heavy tanks, however, had the primary mission to protect the infantry during a frontal assault on an entrenched position. This protection offered dismounted infantry an opportunity to get far enough through the deadly no-man's-land that they would be able to breach the enemy position.<sup>15</sup> This new capability gave ground forces breaching and outflanking options when assaulting enemy positions across a wide breadth of terrain. Ideally, this technology would avoid stagnant trench warfare.

In 1920, the National Defense Act also played a role in the development of armored vehicles for both the Marine Corps and the Army. The act assimilated the Army tank corps into the infantry branch to preclude overspending by the Army. Simultaneously, the Marine Corps focused its efforts on developing mechanized vehicles to move troops and seize advanced naval bases in amphibious operations. Throughout the

interwar period, the Marine Corps closely monitored the Army's mechanization process to help advance its small force technologically while under generally tight fiscal limitations.

In 1931, the mechanization of the Army became a critical point for the new chief of staff, General Douglas MacArthur. His guidance, with direction from the War Department, placed the lead effort for mechanization on the Army's Cavalry branch. By 1933, the cavalry school published the mechanized manual to establish an initial draft of this experimental doctrine.<sup>16</sup> In 1939, Brigadier General Adna Romanza Chaffee Jr., an influential leader in mechanized cavalry forces, began to analyze options for organization, doctrine, and technology of this force. As the analysis progressed, some leaders believed the use of independent armored divisions would play a dominant role in modern warfare. Between 1938 and 1941, the Army experimented with this concept in the first mechanized training operation known as the "Louisiana Maneuvers."<sup>17</sup>

The field training exercises confirmed that mechanized forces could play a decisive role on the battlefield. With never-before-seen maneuverability and the overwhelming shock of their available combat power, it became clear that independent armored formations could provide operational and strategic impacts from the tactical level of war. Poland and France were invaded in 1940 with armored formations that broke through Polish and French defenses. This consequently prompted leaders to split the Army's cavalry corps into two branches: cavalry and armor. The cavalry branch focused on reconnaissance and security while the armor branch emphasized decisive action to defeat an opposing all-armored force. The Army prepared its armored force to compete with tank divisions sweeping across Europe.<sup>18</sup> As a result, the Army

<sup>13</sup> COS to CNO, 9 September 1941 and CNO to CoS, 11 September 1941, both in maneuvers memoranda, general correspondence, RG 337, NARA; Christopher R. Gabel, *The U.S. Army GHQ Maneuvers of 1941* (Washington, DC: U.S. Army Center of Military History, 1992), 56; and Williamson Murray and Allan Millet, eds., *Military Innovation in the Interwar Period* (New York: Cambridge University Press, 1996), 76–77.

<sup>14</sup> David E. Johnson, *Fast Tanks and Heavy Bombers: Innovation in the U.S. Army, 1917–1945* (Ithaca, NY: Cornell University Press, 1998), 73.

<sup>15</sup> Maj George H. Osterhout Jr., "Tanks: General and Tactical," *Marine Corps Gazette* 6, no. 3 (September 1921): 269–78.

<sup>16</sup> Maj Louis A. Di Marco, USA, "The U.S. Army's Mechanized Cavalry Doctrine in World War II" (master's thesis, U.S. Army Command and General Staff College, 1995), 8.

<sup>17</sup> Di Marco, "The U.S. Army's Mechanized Cavalry Doctrine in World War II," 15.

<sup>18</sup> Joseph H. Alexander, "Marine Corps Armor Operations in World War II," in *Camp Colt to Desert Storm: The History of U.S. Armored Forces*, ed. George F. Hofmann and Donn A. Starry (Lexington: University Press of Kentucky, 1999): 185–216.

began to document its tactics in a series of field manuals. The initial copies of the 17 series of field manuals included *The Armored Force, Tactics and Techniques*, Field Manual (FM) 17-10; *Tank Platoon*, FM 17-30; *Tank Company, Light and Medium*, FM 17-32; and *The Armored Battalion, Light and Medium*, FM 17-33.<sup>19</sup> These manuals served as the foundation for tank doctrine and were developed throughout the late 1930s. Between 1940 and 1942, most of the Army's armored manuals were officially published and used to train its units. They included lessons of the Louisiana maneuvers and offered methods that could exploit the armored capabilities and maneuverability of the tank.

With technological advances and war looming on the horizon, the 1930s became one of the most doctrinally prolific periods in all of American military history. The Army developed its mechanized force throughout the 1920s and established an all-armored force with complex training maneuvers, approved tables of organization, and an entire series of manuals by the late 1930s. The Marine Corps, conversely, although it provided observers to the maneuvers, would not consider developing or organizing any armored units until the middle of the decade because of its focus on amphibious landings.

In 1933, the Marine Corps established the Fleet Marine Force. This expeditionary force was organized to plan, support, and conduct amphibious operations in any environment. Within these complex operations, delineating roles and responsibilities for land, sea, and air forces was a critical concern for the FME. By 1934, the Marine Corps drafted the *Tentative Landing Operations Manual*, and much like the Army's 17 series field manuals, it provided structure and clarity to much of the complexity in amphibious operations for the FME. It comprehensively covered command relationships, naval gunfire support, aerial support, ship-to-shore movement, establishment of the beachhead,

logistical activities, and the employment of tanks.<sup>20</sup> To validate this doctrine, the Marine Corps conducted a series of fleet landing exercises (FLEXs). To avoid disasters such as those seen in the Gallipoli campaign in 1915, the Marine Corps knew it must synchronize combat power to efficiently land forces on an enemy-held beach, and it practiced these techniques during the FLEXs.

The FLEXs used the *Tentative Landing Operations Manual* as the protocol for organization and execution of amphibious maneuvers. While the *Tentative Landing Operations Manual* was incredibly detailed in some ways, in others it was not. It recognized the importance of tanks but was relatively vague about how to employ them, and it explicitly identified light tanks as being the most suitable for amphibious operations.<sup>21</sup> Using this regulation as a guideline for amphibious operations, the Marine Corps organized its formations with tanks that could both meet the expectations of supporting infantry and the weight limits for transport by available naval shipping.<sup>22</sup>

To show some critical flaws of this older doctrine, the chapter on employment of tanks deserves scrutiny. The section acknowledged the role of tanks as an element that can be used to reduce friction at the beachhead and assist the infantry advance beyond the initial landing zone.<sup>23</sup> The manual gives some guidance for the tactical employment of tanks in a variety of roles. They can support infantry in landings or drive forward without infantry support to seize key terrain or attack specific objectives that are important to the mission at hand.<sup>24</sup>

This portion of the manual is important because it parallels doctrinal employment of Army tanks. In the Army, tanks were fundamentally designed to combat armored divisions using mobility to seize terrain that was vital for the survival and tactical success of an

<sup>19</sup> *The Armored Force Field Manual, Tactics and Techniques*, FM 17-10 (Washington, DC: Government Printing Office, 1942); *Tank Platoon*, FM 17-30 (Washington, DC: Government Printing Office, 1942); *Tank Company, Light and Medium*, FM 17-32 (Washington, DC: Government Printing Office, 1942); and *The Armored Battalion, Light and Medium*, FM 17-33 (Washington, DC: Government Printing Office, 1942).

<sup>20</sup> *Tentative Landing Operations Manual*, table of contents.

<sup>21</sup> *Tentative Landing Operations Manual*, 225.

<sup>22</sup> Isely and Crowl, *The U.S. Marines and Amphibious War*, 55, 57; and Estes, *Marines Under Armor*, 9.

<sup>23</sup> *Tentative Landing Operations Manual*, 226.

<sup>24</sup> *Tentative Landing Operations Manual*, 225.

operation. The Marine tentative manual clearly supports this opinion.

In addition, the tactical principles described in the manual were considered critical for the employment of tanks. Tanks should be made available in large numbers to deliver a concentrated blow to the enemy and draw fire or be employed individually to draw fire from enemy defenses.<sup>25</sup> This expresses the importance of mutual support among tanks. Massing the effects of armored forces to deliver a decisive blow to the enemy as described in the manual would thereby provide mobility to the accompanying infantry forces. This type of operation is also very similar to the Army's theory and doctrine for fighting with armored forces.

Ultimately, the meager two pages on tanks provided by the *Tentative Landing Operations Manual* were inadequate and the manual overall lacked detail on tank employment for amphibious operations. The Marine Corps' tentative manual demonstrated a fundamental misunderstanding of the organization of tank units. Furthermore, tank technology had simply not been tested and would not be evaluated until the FLEXs commenced to validate the use of armor in amphibious assaults. As Marine tank units organized, a lack of Marine Corps tank doctrine to guide leaders led to a reliance on the Army's armored force doctrine and training.

In January 1935, the Marine Corps conducted FLEX 1. This exercise did not include any of the Corps' tank units due to a shortage of funds. New budgetary resources allowed for tank procurement the following year and on 1 March 1937, the 1st Tank Company, 1st Marine Brigade, was activated at Quantico, Virginia. It was armed with five new Marmon-Herrington combat tanks, light (CTL), because they were the only armored vehicles at the time capable of meeting the weight limitations for transport on board naval artillery lighters.<sup>26</sup> While the rest of the FMF continued to FLEXs 2 and 3, the newly organized tank company conducted organizational training to devel-

op further the technical and tactical needs of the unit.

In January 1938, FLEX 4 took place and became the first to include the Marine tankers in an operational role. Although transporting the vehicles to shore proved difficult—because only one lighter with the capability to carry heavy vehicles was available—the tactical employment of the tanks was a relative success. The tanks landed with the assault force and assisted in eliminating resistance on the beach. Conversely, tanks used in the defense provided an outstanding counterattack capability without infantry support. A report of the FLEX recounts their success as a “brilliant use of tanks made in a counterattack.”<sup>27</sup> The initial success of the tanks was promising, but a lack of infantry support was considered a success by many commanders. This compounded the flaws of armor doctrine not only among the armor units but also among operational-level staff that were coordinating and planning the employment of tanks in an amphibious operation.

After FLEX 4, technological advances improved the effectiveness of the current Marmon-Herrington CTL tanks, which were known to consistently throw tracks. After FLEX 5 in 1938, the newer CTL models suffered different mechanical issues from stresses induced by speed and lubrication of the vehicle.<sup>28</sup> Although the Army's M2 medium tanks outperformed the Marine Corps' CTLs, the M2s weighed nearly 10 tons, far too heavy for naval landing craft of the time.<sup>29</sup> This forced the Navy to contact a private boat builder in New Orleans, Andrew Higgins, to assist in developing landing craft that were capable of giving an amphibious force a heavy lift capacity for newer tanks.<sup>30</sup> The Marmon-Herrington manufacturers continued to make upgrades and lighten the CTL. However, in 1938, the Marine Corps Equipment Board met to discuss the future of Marine tanks. They concluded that the Marine Corps would purchase some tanks from

<sup>25</sup> *Tentative Landing Operations Manual*, 226.

<sup>26</sup> Arthur E. Burns III, “The Origin and Development of U.S. Marine Corps Tank Units: 1923–1945” (student paper, Marine Corps Command and Staff College, 1977), 20.

<sup>27</sup> Fleet Landing Exercise No. 4 Reports, CG, 1st Marine Brigade, 12 March 1938, RG 127, Box 2, NARA.

<sup>28</sup> Estes, *Marines Under Armor*, 16–18.

<sup>29</sup> Estes, *Marines Under Armor*, 9.

<sup>30</sup> Alexander, “Marine Corps Armor Operations in World War II,” 189; and Isely and Crowl, *The U.S. Marines and Amphibious War*, 57.

the Army's arsenal of M2A4 light tanks and test their abilities during FLEX 6 in January 1940.

Following FLEX 6, the Corps' leadership considered the Army's M2A4 far superior to the CTL. It offered more firepower and maneuverability, although its suspension was susceptible to weakness due to the effects of saltwater. Despite this vulnerability, the Marine Corps approved funding to purchase 18–20 of the Army's M2A4 tanks. While the Marines monitored the progress of the Army's tank development, they became aware of the unique and detailed doctrine that the Army developed after some lengthy armored maneuvers.

The Army and Marine Corps developed their respective doctrines to support their new armored and amphibious missions. Although they developed their concepts separately, the two forces shared critical aspects of their technology and theory. Between 1934 and 1941, significant training took place between both organizations with the objective to refine their tactics. Simultaneously, the two organizations shared technological and doctrinal innovations to facilitate preparations for the increasingly imminent threat in Europe and the Pacific. The Army and the Marine Corps also provided cross-training in amphibious doctrine as well as armor doctrine. The Army used the Navy's *Landing Operations Doctrine*, Fleet Training Publication (FTP) 167 (1938), almost verbatim to formulate its *Landing Operations on Hostile Shores*, FM 31-5 (1941).

The interwar period saw aggressive mechanized training programs develop across the Army. In July 1940, General Adna Chaffee was appointed as the chief of the Army's armor branch and was given complete control over its doctrine, organization, and equipment.<sup>31</sup> Chaffee, raised as a cavalry officer, became a staunch supporter of an independent armored force. The War Department accepted his general view of establishing an armored force and published it as doctrine in *Field Service Regulations: Operations*, FM 100-5. It described the armored division as the basic unit of the combined arms that can conduct independent operations. It is organized specifically to per-

form missions that require mobility and firepower and achieve decisive effects, particularly in the rear and support areas of the enemy.<sup>32</sup> This description shows how much independence the Army believes its tank units should retain. An armored force organized for independent operations served as the foundation for the Army's 17 series field manuals used for training Army tank units. Those tactics were being taught to Marine armor units after FLEX 6 took place in 1940.

In late 1942, the Army's new armored force manuals were published: *The Armored Force Field Manual, Tactics and Techniques*, FM 17-10, in March 1942; *The Tank Company, Light and Medium*, FM 17-32, in August 1942; *The Armored Battalion, Light and Medium*, FM 17-33, in September 1942; and *The Tank Platoon*, FM 17-30, in October 1942. These manuals became fundamental parts of training in both the Army and Marine Corps. While they stressed the maneuverability and independence offered by tank organizations, they provided guidelines and other combined arms parameters that should be used by armored force commanders. This would negatively impact the employment of tanks in the Pacific because of the different operating environment encountered. Deeply entrenched forces that were primarily dismounted, compounded by restricted island terrain, were a vast difference from the Army's expected environment and the threat the Army would fight in Europe.

It was efficient to share these aspects of their operations, however, the transfer of information between the Army and the Marine Corps without an accompanying analysis reduced the understanding of armor's capabilities and came at a cost. Marine First Lieutenant Robert M. Neiman served as a tank officer in command of Company D, 2d Tank Battalion. While his light tank company organized at Camp Pendleton, California, he reflected on the lack of doctrinal information. Tank models differed each month and there were no tactical manuals, only technical manuals, and therefore much of their training revolved around maintenance. To receive tactical training, Lieutenant

<sup>31</sup> F. M. Andrews memo to Adjutant General, G-3, 5 July 1940, RG127, Box 8, NARA.

<sup>32</sup> *Field Service Regulations: Operations*, FM 100-5 (Washington, DC: Government Printing Office, 1941), 278.

Neiman had to send his officers and sergeants to the Army's armor course at Fort Knox, Kentucky.<sup>33</sup>

Neiman described an important reality for many Marine tank officers. Because no systematic tactical training was available in the Corps' tank training center at Jacques Farm at Camp Pendleton, they often received their schooling at the Army's tank course at Fort Knox. The fundamental tactics they learned came from Army doctrine that was refined at the general headquarters maneuvers of 1941 and published in the 17 series manuals. Marine tanker training at Jacques Farm allowed units to practice their tactics, but it included an inordinate amount of mechanical driving and technical training. It compounded the primary difference in Army and Marine doctrine and would negatively impact many Marine Corps tank organizations.

Meanwhile, the amphibious doctrine was codified when the U.S. Navy published the *Landing Operations Doctrine*, FTP-167, in 1938. This document served as the reference for all amphibious operations conducted by the Navy. The manual drew heavily on the vague armor tactics, techniques, and procedures outlined in the Marine Corps' own *Tentative Landing Operations Manual* of 1934. As the Corps continued to focus on amphibious operations, it struggled to develop an amphibious tank that possessed sufficient maneuverability to be useful in a land battle. Much of the Corps' effort went into developing tracked transports that were capable of carrying troops and equipment quickly during the ship-to-shore phase and that provided some protection and maneuverability on land. As the Marine Corps received tank technology and doctrinal training from the Army, flaws crept into the development of its tank corps; they were exposed only when they became employed in the Pacific theater.

### Armor Operations 1941–1943: The Testing Grounds

At the outbreak of war, many Marine tank battalions and companies were activated quickly and saw lim-

ited training before shipping out, while the Army had many more armored units organized and in the field. Furthermore, a rush in equipping units with tanks created an environment in which multiple variants of tanks with different maintenance and support requirements resided in the same company or platoon, making it a logistical nightmare to sustain. Some tanks arrived at units across the theater without radios, periscopes, and other critical items, adding to the challenges encountered in the physical environment.<sup>34</sup>

In August 1942, the Marine-led offensive at the island of Guadalcanal began and became the testing ground for Marine armored units of the 1st and 2d Tank Battalions. Guadalcanal offered restricted terrain that exposed vulnerabilities in tanks when employed in dense jungles and along terrain with severe slopes. The tanks were landed following the infantry assault and given the primary task to expand the beachhead and defend Henderson Field, both areas of relatively open ground. In most cases, they were employed precisely as the *Tentative Landing Operations Manual* directed.<sup>35</sup> Tanks helped to secure victory at a critical point of the battle: at the engagement along Tenaru Ridge on 21 August 1942. Tanks of the 2d Tank Battalion integrated into an infantry counterattack force that engaged a pocket of die hard Japanese defenders. Although the tank-led counterattack was extremely successful in this instance, this was not always the case.

On 14 September, an unsupported platoon of six tanks advanced past a ridge occupied by Company K, 3d Battalion, 1st Marine Regiment. Japanese forces ambushed the independent tank platoon, and as the platoon leader reacted, the tanks were unable to effectively coordinate movement through the dense jungle underbrush. The tanks struggled to communicate and maneuver to support one another, giving the Japanese an opportunity to destroy two tanks, disable a third,

<sup>34</sup> Estes, *Marines Under Armor*, 39.

<sup>35</sup> The *Tentative Landing Operations Manual* describes the use of tanks according to section 2-1002 and explains that "tanks may provide assistance step by step against defensive installations as they are successively encountered or they may drive forward to a definite objective without regard to the progress of the infantry."

<sup>33</sup> Robert M. Neiman and Kenneth W. Estes, *Tanks on the Beaches: A Marine Tanker in the Pacific War* (College Station: Texas A&M University Press, 2003), 55.

and cause a fourth to capsize in a river, drowning the crew.<sup>36</sup>

The counterattack at Henderson Field and Tenaru Ridge offered both success and failure for the two Marine tank battalions. It showed great potential for tanks when used as they were trained to fight, but it also revealed their vulnerability in some terrain. According to the *Tentative Landing Operations Manual* and the Army's *Armored Battalion, Light and Medium*, FM 17-33, the actions on 21 August were precisely in line with the doctrine while those of 14 September were not. By the completion of the battle on Guadalcanal, Marines presumed that the mutual support with infantry was key in dense jungle terrain, but there was no significant effort to capture this in any kind of doctrine. Furthermore, tanks in support of an amphibious force had yet to be tested.

Armor played a limited role in the overall success of the Guadalcanal campaign because of the restricted jungle terrain, but the use of tanks provided foreshadowing of ways to more effectively employ tanks in the Marine Corps. Although the environment confined tank units, the doctrine they were trained on only discussed the role of tanks in a beach landing. Guadalcanal opened an entirely new perspective on the employment of tanks as an exploitation force. Exploitation of the lodgment in restricted jungle terrain was an alien concept to Marine tankers. Tank and infantry cooperation took place in some units, but overall it was almost nonexistent in the campaign. The Army-influenced armor operations at the platoon and company level became the primary concern. By the end of the Solomon Islands campaign—although combined infantry-armor tactics was a new concept being discussed—capturing and employing those lessons was not taken seriously above the battalion level. Tank tactics were therefore left unrefined except for minor task organization changes that were taken directly from the Army table of organization for tank battalions operating in North Africa. Richard Tregaskis, a veteran journalist covering Guadalcanal, wrote in his book *Guadalcanal Diary* about his experience

with tanks that functioned without infantry support; he described tanks fighting in the jungle as vicious and in independent formations without much coordination.<sup>37</sup>

After Guadalcanal, operations across the Solomon Islands and New Britain allowed tanks and infantry to test their mettle and tactics in a jungle environment but not during amphibious landings. Many Marine battalion-level leaders had a general concern about the light tanks adopted by the Army and their effectiveness in the jungle terrain. Light tanks had much less armor and were vulnerable to antitank attacks by up-close Japanese soldiers. They clearly required additional support from infantry, but Marines continued to plan operations in independent units as prescribed by the 1942 armored force field manuals and training courses. Combined with the inability of higher-echelon leaders to recognize the importance of organizational and doctrinal change, this eventually led to catastrophe at Tarawa, where close infantry and armor synchronization early on could have prevented substantial losses.

By 1942, the landing ship, tank (LST) and landing ship, medium (LSM) were introduced, allowing heavier vehicles to be transported much closer to the beach landing. The M4 Sherman medium tank also was introduced to the FMF, and together these new assets made armor in the Pacific much more versatile. The Army's newly developed M4A2 had heavier armor, a larger main gun, and a stronger dual diesel engine.<sup>38</sup> The boost in sealift capability also provided versatility, expanding the types of armored vehicles that could be moved ashore. Other technological innovations emerged that increased the flexibility of tank units, including the EE-8 tank telephone, the dismounted flamethrower, and armored bulldozer. This gear contributed to previous successful Marine operations in New Guinea and the isolation of the Japanese fortress

<sup>37</sup> Richard Tregaskis, *Guadalcanal Diary* (New York: Random House, 1943), 142.

<sup>38</sup> R. P. Hunnicutt, *Sherman: A History of the American Medium Tank* (Belmont, CA: Taurus Enterprises, 1978), 143; Steven Zaloga, *Armored Thunderbolt: The U.S. Army Sherman in World War II* (Mechanicsburg, PA: Stackpole Books, 2008), 321; and Bale, "Edward Bale Oral History Interview."

<sup>36</sup> Alexander, "Marine Corps Armor Operations in World War II," 191.



of Rabaul, yet the units bound for Tarawa received only minimal equipment and training on it.

## Armor in the Battle of Tarawa: The Proving Grounds

Operation Galvanic was the first large-scale opposed landing of forces in the Pacific theater to test armor in opposed amphibious doctrine. Like any military operation, it began with an in-depth assessment of the terrain and the enemy on the objective. The topographical assessment of the island revealed an average elevation of 8 to 10 feet, gradual slopes, and beaches of coral and sand.<sup>39</sup> The contour of the terrain gave defensive machine gun fire and prepared positions the upper hand but seemingly offered an edge to armored units. There would be little protection for assault troops, making it more important to ensure tanks and other armored vehicles became integrated into the initial landing.

Accordingly, based on the situation, the *Tentative Landing Operations Manual* described a purpose for tanks in every wave. In the leading assault wave, tanks would destroy beach defenses, and tanks in the following waves would be prepared to outflank identified enemy positions. Tanks as part of the reserve element could only focus on land warfare and could likely not affect actions on the beach.<sup>40</sup> This engagement as part of a reserve, compounded by relative success in previous campaigns, made it seem that independent armor operations taught in Army doctrine would serve well on Tarawa. It directly correlated with the independent maneuver expectations of tank companies and platoons as outlined in the Army's armored force field manuals.

The 2d Marine Division had not yet used medium tanks in action.<sup>41</sup> The division had one organic light tank battalion: the 2d Tank Battalion consisted

of M3 Stuart light tanks, and for this operation it was reinforced with Company C of the 1st Corps Medium Tank Battalion, which included the new M4 Medium Sherman tank. This augmentation became one of many table of organization changes for the Marine Corps. It reduced the number of light tank companies from four to three, and the fourth became a medium tank company.<sup>42</sup>

Company C, commanded by First Lieutenant Edward L. Bale Jr., included 14 M4 tanks. As the staff sequenced the assault of Tarawa, this would be the only company of armor available in the initial phase of the landing. The 18 remaining M3s of the 2d Tank Battalion would only come ashore as part of the reserve. First Lieutenant Bale's tanks were scheduled as part of the fifth wave and assisted in exploiting a deeper penetration into the island after initial forces secured the lodgment.<sup>43</sup> According to Marine Corps amphibious doctrine and the Army's independent armor operations, the tanks would be most useful outflanking the Japanese defenders encountered on the beach. This would therefore provide the landing force an opportunity to secure the airfield farther into the island. What they encountered, however, was certainly not the ability to outflank identified Japanese defenses.

Japanese defenses included eight coastal defense guns, 23 75mm guns, and 56 37mm antitank guns, as identified by photoreconnaissance. Marine planners believed that the Japanese would stubbornly defend their positions as part of their mission to cause as many casualties as possible to protect the airfield. Considering the restrictions of terrain and the enemy heavy weapons emplacements and pillboxes on the island, it seemed that Company C of the 1st Corps Tank Battalion (Medium) provided sufficient support to the division for the initial assault on the island. The tankers were trained to maneuver in relatively open terrain and armed with heavier armor and weaponry. If they were employed as they had prepared to fight, their mission on Tarawa seemed fairly easy.

The integration of the newly assigned M4 tanks,

<sup>39</sup> Col Joseph H. Alexander, *Utmost Savagery: The Three Days of Tarawa* (Annapolis: Naval Institute Press, 1995), 76–68; Isely and Crowl, *The U.S. Marines and Amphibious War*, 210–11; and Gilbert, *Marine Tank Battles in the Pacific*, 78.

<sup>40</sup> *Tentative Landing Operations Manual*, 265.

<sup>41</sup> Col Joseph H. Alexander, *Across the Reef: The Marine Assault of Tarawa* (Washington, DC: Marine Corps Historical Center, 1993), 6.

<sup>42</sup> USMC T/O E-80, approved 15 April 1943.

<sup>43</sup> Estes, *Marines Under Armor*, 1.

however, was extremely inadequate. While the division task force conducted detailed rehearsals on the island of Éfaté, French New Hebrides, Bale's company of Sherman tanks held its rehearsals separate from the rest of the division at Nouméa, New Caledonia.<sup>44</sup> "There was no training with the infantry. None at all," explained Bale.<sup>45</sup> The division rehearsal focused almost entirely on the ship-to-shore movement of troops and did not include critical enablers, such as the amphibious tractor battalions and aviation support assets.

This indicated an institutional ignorance in the operational art of combined arms. Junior leaders involved in the operation, without any form of rehearsal or any doctrinal training on employing combined arms, were doomed from the beginning. No joint plan to properly synchronize use of the tanks existed in the Marine Corps. Worse still, there was no clear objective for the armor because the published doctrine instructed tanks to be used as an independent reserve and an exploitation force. Unfortunately, the guidance for tanks at the company level and below was similar to interwar Army doctrine, junior leaders learned. Tank battalions were organized as independent units at the division level, and their training and capabilities did not coincide with any training conducted with other forces, such as the infantry, amphibious tractor battalions, artillery, or air forces.

Unfortunately, after the Solomon Islands, some concerns of independently employing tank units had already been pointed out. Close infantry support and prior planning may have mitigated the failures that resulted in heavy tank losses, but no one in the FMF staff considered this necessary prior to Tarawa. The development of the tank telephone and combined infantry tactics were discussed extensively among leaders; however, the fundamental lessons were not applied to any consolidated doctrine.

## D-Day on Betio Island

The Tarawa Atoll was a small island chain surrounded

by a coral reef that formed a lagoon protected from strong ocean waves. Betio Island was the southernmost island in the atoll and the primary objective for Operation Galvanic because of the airfield it maintained. This allowed the island to serve as a jumping-off point to attack and seize the Marshall Islands.<sup>46</sup> As the invasion force positioned its ships for the pre-assault bombardment and as transports entered the lagoon, the assault operation immediately began to go wrong. The fringing coral reef, covered by at most four feet of water, allowed tanks to maneuver where landing craft, vehicle, personnel (LCVPs), and landing craft, mechanized (LCMs), could not.<sup>47</sup> The water levels only permitted a four-hour window for landing craft to land on the lagoon side of Betio. Additionally, a combined wire and coconut-log wall along the southern and western shores of the island channeled armor to approach elsewhere.

The first report hinting at serious problems with the assault came from an LCVP in the first wave. The crew explained that their craft could not maneuver to the shore because it was striking the coral reef. During the hydrographic assessment of the island during planning, analysts had not recognized that a neap tide would restrict landing craft in crossing over the reef, even at the highest tidal period.<sup>48</sup>

Once on shore, more problems occurred. The newly assigned regimental commander of the 2d Marines, Colonel David M. Shoup, landed after the first wave and immediately encountered heavy fire, stiff resistance, and mounting casualties on the beach. He called for earlier tank support, believing that the tanks would be able to suppress the accurate enemy fire. As the LCMs carrying the tanks circled outside the reef awaiting their prescribed landing time, they received

<sup>46</sup> Isely and Crowl, *The U.S. Marines and Amphibious War*, 198.

<sup>47</sup> Isely and Crowl, *The U.S. Marines and Amphibious War*, 6.

<sup>48</sup> A neap tide occurs when the sun and moon are at right angles to the Earth. Since the gravitational pull on the water comes from opposite directions, the tide becomes lower or higher than normal. The neap tide that occurred at Betio, known as "dodging tides" by the Tarawa locals, was lower than expected for more than 24 hours, which continued to hamper resupply of troops and equipment to shore and made them susceptible to heavy Japanese machine gun fire.

<sup>44</sup> 2d Tank Battalion, USMC, "Special Action Report of the Second Tank Battalion, from CO 2d Tank Battalion to CG 2d Mar Div," 14 December 1943, RG 127, Box 70, NARA.

<sup>45</sup> Alexander, *Utmost Savagery*, 61.



Reference Branch, Marine Corps History Division, #64260

Light tank coming ashore over reef, Battle of Tarawa.

an order to land the tanks on the coral reef and send them to the landing zone. During the approach, Bale ordered six of his tanks to Red Beach 1 on the western side of the landing zone, while the remaining eight headed to Red Beach 3 on the eastern side. The movement to the beaches, however, proved to be difficult. Massive craters in the coral reef, caused by short-falling shells of the naval and aerial bombardments, swallowed seven tanks and their crewmen before they could even get to the beachhead. Additionally, two M4s were destroyed en route by Japanese guns, and an American dive-bomber accidentally struck another after it reached the shore.<sup>49</sup>

After successfully maneuvering across the reef,



Reference Branch, Marine Corps History Division, #T-P-7-57406

Two left alive: members of a tank unit sit atop their giant vehicle, stalled in a water-filled shell hole. In the background rests other immobilized armored amphibious monsters.

the remaining four tanks made landfall. Without radio communications available to talk to infantry units on the ground, the tankers received only a vague order to “knock out all enemy positions encountered.”<sup>50</sup> Although in line with the doctrine that many of them were trained on, this proved lethal for some tank crews. Because the tanks would maneuver forward independently without infantry support, they were virtually blind and vulnerable to Japanese counterattacks. By the end of the first day’s fighting, only two of the M4s remained operational and a third was severely damaged. The surviving armor forces gathered ammunition and organized with pockets of surviving infantrymen for the night.

The next two days of combat on Betio consisted of ad hoc tactics. Small groups of infantrymen and tankers coordinated with unofficial methods of communication. The infantrymen and tankers quickly established a series of hand and arm signals to corre-

<sup>49</sup> Estes, *Marines Under Armor*, 72–73.

<sup>50</sup> Alexander, *Across the Reef*, 17.



Reference Branch, Marine Corps History Division, #63967

Medium tank in support of men along Red Beach #3 during the Battle of Tarawa. Burns Phillips Pier is just visible in the background.

spond with their actions.<sup>51</sup> When not possible, infantrymen would often ride on the turrets of the tanks to converse with the tank commander. This allowed troops to speak with tank commanders, but it placed many lives at risk. Talking with the infantry support was critical for tank commanders. This enabled them to support one another through maneuver and direct fire. The reserve M3 tanks arrived on 21 November 1943 to assist in securing the island. During numerous engagements that day and on 22 November, the 37mm cannon of the M3 light tanks proved ineffective against Japanese pillboxes. Only the power of the

M4's 75mm cannon could neutralize dug-in enemy positions.<sup>52</sup> On the final day of the battle, after a massive Japanese counterattack, a combined force of tanks, combat engineers, flamethrowers, and infantry from the 3d Battalion, 6th Marines, attacked the dwindling Japanese resistance. The troops maneuvered rapidly and, with close coordination, quickly rolled up the remaining Japanese elements.

On 23 November, the Marines finally secured the island, marking the end of the battle—but at a significant cost. With 3,133 total casualties, this was nearly the same amount of losses experienced on Guadalcanal. Since Tarawa lasted only 76 hours and Guadalcanal lasted almost six months, public officials

<sup>51</sup> Alexander, *Utmost Savagery*, 127, 152; Bale, "Edward Bale Oral History Interview"; Gilbert, *Marine Tank Battles in the Pacific*, 104; and 2d Tank Battalion, USMC, "Special Action Report of the Second Tank Battalion, from CO 2d Tank Battalion to CG 2d Mar Div," 14 December 1943, RG 127, Box 70, NARA.

<sup>52</sup> Alexander, *Across the Reef*, 39.



*Reference Branch, Marine Corps History Division, #63590*

One of the force's medium tanks put out of action. Notice the marks from direct hits on the side.

demanded an explanation.<sup>53</sup> The carnage of Tarawa was unparalleled compared with other battles up to this point in the war, and senior leaders were called on to respond.

In an after action report on the battle for Tarawa, the atoll attack was said to resemble “in many respects the assault of a fort with the added complication of having to initiate the assault by a ship-to-shore movement” due to much more heavily defended enemy bunkers than expected.<sup>54</sup> Sadly, photoreconnaissance had not previously revealed these emplacements, which caused a significant number of casualties, and

the M3 light tanks, although maneuverable and fast, could not actually destroy them.

The M4, with its heavier cannon and additional armor, was able to penetrate fortified Japanese bunkers. It became the tank of choice for the Marine Corps after Tarawa. In the face of losing 10 tanks during the initial landing, the two Company C tanks that survived, both M4s, outgunned every remaining enemy bunker. The Marines also recognized the effectiveness of the flamethrower and requested it be added as a tank weapon to increase the M4's effectiveness.<sup>55</sup>

A lack of accurate intelligence and joint training was responsible for many losses at Tarawa, but most fatalities could have been prevented if combined tank and infantry tactics adapted to the environment ear-

<sup>53</sup> Josh Hudak, “Through Crimson Tides: Tarawa's Effect on Military Tactics and Public Perception of War” (master's thesis, Clemson University, 2014), 47–48.

<sup>54</sup> Brief Report of Amphibious Operations for the Capture of the Gilbert Islands, 6 January 1943, RG 38, Box 8, NARA.

<sup>55</sup> A. H. Nobel, “Brief on Tarawa Operation,” CINCUS Plans Division, 5 December 1943, RG 38, Box 8, NARA.



*Reference Branch, Marine Corps History Division, #63805*

Marine Corps tank knocked out during the battle.

lier. Veterans of the battle realized that establishing a common communication platform between infantry and armor would have also reduced casualties, especially among tank units. The tactics developed on Betio often required tanks to maneuver in front of the advancing infantry. A lack of radio communications forced tank commanders to expose themselves often to communicate with the infantrymen, incurring unnecessary risk. Following the Solomon Islands campaign, the lessons learned called for equipping all tanks with the EE-8 tank infantry telephone. After Tarawa, it was no longer a discussion; close supporting tank infantry tactics were applied to all future campaigns.<sup>56</sup>

Ultimately, the Army's armored forces doctrine, used to train and equip Marine tank battalions since 1938, had failed the Marine Corps on Tarawa. At the staff level, there was a lack of understanding of tank battalion vulnerabilities and capabilities. Leaders failed to capture tactical lessons of the Solomon Islands campaign that would have offered insight on how to use tanks in a more appropriate manner during an amphibious assault of a heavily defended area. If tank battalions were given a directive to act in an infantry support role, many tactical and organizational problems could have been dealt with during the preparations for the invasion.

The ineffective employment of armor on Tarawa revealed other important issues that were not consid-

<sup>56</sup> Estes, *Marines Under Armor*, 74.



*Reference Branch, Marine Corps History Division, #64161*

Members of a light tank crew pose in front of Japanese plane revetment.

ered during the planning phase. The night of 21 November, a tank with a severely damaged main gun was repaired after mechanics cannibalized other disabled tanks.<sup>57</sup> The responsive maintenance of damaged tanks was critical to the tactical accomplishments of tanks and infantry on 21 and 22 November. Tank rounds also were not readily available due to challenges establishing supply points on the highly contested beach. This forced many tanks to return to the beach and scour destroyed tanks for remaining main gun ammunition.<sup>58</sup> Further debriefings revealed that heavy fire damaged tank periscopes, limiting the visibility of the entire crew. With limited communications abilities, periscopes proved critical in allowing tanks to provide accurate fire throughout the fight. Replacement periscopes also were scavenged from damaged tanks since additional periscopes were not on hand.<sup>59</sup>

### **Armor Operations 1943–1945: Codifying New Doctrine**

The lessons from Tarawa were applied to units across the Pacific theater almost immediately. In the next year and a half, units fighting in the Pacific theater

adjusted their tactics through local unit SOPs. These SOPs were the temporary fix for the flawed doctrine tank units were taught to fight with. The procedures were modified to be suited to the expected adversary and the terrain they prepared to fight in. This is first seen in the invasion of Kwajalein Island in the Marshall Islands campaign on 31 January 1945, during which unit commanders reduced independent tank maneuvers to protect their vulnerable infantry. By 1945, Marine Corps units completely reorganized tank battalions, trained crews differently, and armed their tanks with a variety of more capable weapons to defeat entrenched Japanese forces.

As the campaign in the central Pacific progressed north, the island of Saipan became the target in early summer of 1944. The battle presented another opportunity to expand on lessons from Tarawa. It was the first operation in which tank units used the new Table of Organization F-80. This included other innovations, notably the flame tank.<sup>60</sup> First Lieutenant Bale, the commander of Company C that assaulted Tarawa, also saw combat on Saipan. He recognized a critical training deficiency among his tankers before Tarawa but saw dramatic changes in his company by the Battle of Saipan. After landing on the beaches, his tanks had to maneuver through 500–600 yards of water. Despite heavy mortar and artillery fire, his tanks maneuvered across the beaches, contacted the infantry, and immediately began to fight alongside them.<sup>61</sup>

The Battle of Okinawa was the culminating point of the war in the central Pacific. Okinawa saw the implementation of all the changes that tankers and leaders desired at Tarawa. The result was the deadly and systematic use of tanks and infantry on challenging terrain against a bitter enemy. Unlike any employment of tanks that took place in Europe at the same time, the Battle of Okinawa mirrored how tanks were employed nearly 30 years earlier in World War I. Operating strictly to support the maneuver of infantry forces engaging a heavily entrenched enemy, tanks gave maneuverability to a battlefield with otherwise restricted terrain. While the landing was unopposed,

<sup>57</sup> Alexander, *Across the Reef*, 18.

<sup>58</sup> Estes, *Marines Under Armor*, 73.

<sup>59</sup> Nobel, "Brief on Tarawa Operations," 3.

<sup>60</sup> Nobel, "Brief on Tarawa Operations," 67.

<sup>61</sup> Bale, "Edward Bale Oral History Interview."



Reference Branch, Marine Corps History Division, #121929

1st Marine Division, Okinawa, 11 May 1945. Flame-throwing tank and riflemen moving up to the frontline action on Okinawa.

the battle provided a valuable representation of how the use of armor had changed since Tarawa.

By the end of the Second World War, an important conference brought together commanders from nearly every Marine tank battalion, amphibious tractor battalion, and staff for corps and division headquarters. This conference was the first formal event to modify armor doctrine. They met at Schofield Barracks, Hawaii, on 26–29 April 1945 to discuss “tank matters.” The commanders reviewed and tentatively approved tank battalion organization, the *FMF PAC Tank Infantry SOP* (FMF Pacific [FMFPac]), flame-

thrower employment, and extensive tank modifications.<sup>62</sup> The attendees addressed the vague interwar doctrine in the *Tentative Landing Operations Manual* and the inadequate prewar 17 series field manuals published by the Army. It began a process of developing sound techniques to use tanks in amphibious operations and general land operations for the Marine Corps.

<sup>62</sup> Memo from CG, FMFPAC, to the CGs of VAC, 3d, 4th, and 5th Marine Divisions, serial number 00920-45, RG 127, Box 18, NARA.





*Reference Branch, Marine Corps History Division, #121930*

Marine riflemen moving up behind flame-throwing tank on Okinawa.



*Photo by Sgt Frank C. Kerr, NARA 127-GK-234A-A2290*

Marine M26 Pershing tanks were also used during the Korean War to give close support to leathernecks, as depicted here.

During the first two days of the conference, leaders discussed the future of armor and solidified the doctrine that Marine tank units would use.<sup>63</sup> They spent a significant amount of time discussing the current SOP and possible revisions concerning the role of

<sup>63</sup> Schmidt, report of conference for C/S FMF PAC, 2.



*Courtesy Texas Military Forces Museum*

An M24 Chaffee tank on display at the Texas Military Forces Museum.

engineering and artillery assets during tank-infantry operations. By the third day, a draft SOP was developed, and the leaders discussed task organizational changes that might be necessary. The selection of an appropriate table of organization lasted two days and included a recommendation to acquire new Army M26 Pershing and M24 Chaffee tanks. By the fifth and final day, a new SOP and table of organization were developed. The discussion at the conference closed with a debate on the current M4 series tanks. They decided to increase its armor and communication capabilities and to replace the 75mm main gun with a

new main gun based on tactical engagements at the Battle of Iwo Jima.<sup>64</sup>

Modifications to the tables of organization included ammunition, weapons and equipment, personnel, and general task organization of platoons, companies, and battalions. Before the Battle of Tarawa, the Marine table of organization for a tank battalion closely resembled the Army's tank forces in Europe. After Tarawa, the first changes reflected a shift in the use of tanks. By the end of the conference, the new organization in general supported complete integration of tanks with infantry. Company headquarters were authorized jeeps, which were utilized to coordinate and move tanks throughout their zone of operation.<sup>65</sup>

The revised FMFPac SOP for tank-infantry coordination became the replacement for the Army's *Employment of Tanks with Infantry*, FM 17-36. Developed in June 1944, it was a collection of revised tactics derived from after action reports from the Mediterranean theater and replaced the Army's *Tactics and Technique* (FM 17-10) and *The Armored Battalion, Light and Medium* (FM 17-33). The new manual included logistical requirements and command and control techniques for operating with an infantry battalion. While this was important, it also discussed modifications to the task organization of these units at the company and platoon levels.<sup>66</sup> Task organization modifications were discouraged throughout the manual. The manual still supported operations no lower than an organic company when attacking a pillbox, or even in jungle terrain.<sup>67</sup> This new doctrine was disseminated to the armor community, including the Marine Corps.

The conference members moved on to tackling the problems that plagued training. During the conference, commanders addressed the deficiency in training identified by Lieutenant Bale prior to Betio. Betio illustrated the necessity of tank-infantry training, which leaders incorporated into their operations

in the following campaigns to prevent uncoordinated support. Training, then, was also an addition to the new SOP. The conference ensured that the SOP captured the requirement for complete tank integration in all rehearsals. This would prevent confusion with landing craft during ship-to-shore movement and improve responsive tank support once the vehicles got ashore.<sup>68</sup>

The conference adjourned on 29 April 1945 and the FMFPac staff published the revised SOP and organizational charts. The draft—with its summary of all tentative changes to the table of organization recommendations on modifying the M4 and specialized equipment capabilities—was sent to every division commander and tank battalion for review. Between July and August 1945, comments concerning the outcome of the conference filtered back to the FMFPac staff. Commanders were almost unanimous in accepting the revisions and updates to tank matters from the conference.<sup>69</sup> Some comments called for slight changes in organization and communication, but the final revision provided the table of organization and SOP that would serve as the foundation of armor employment in amphibious operations for the next series of Marine doctrine.

## Conclusion

As the Pacific war ended, the use of tanks proved a decisive aspect of ground operations against the Japanese. The “storm landings” by Marine and Army forces against stubbornly defended Japanese-held islands were like no other in history. By 1945, the Marine Corps tank no longer operated independently, as it did on Guadalcanal. Armor units were embedded with infantry battalions and had developed joint doctrine that efficiently processed Japanese defend-

<sup>64</sup> Schmidt, report of conference for C/S FMF PAC, 1-3.

<sup>65</sup> USMC T/O G-76, approved 1 May 1945.

<sup>66</sup> *Employment of Tanks with Infantry*, FM 17-36 (Washington, DC: Government Printing Office, 1944), 21.

<sup>67</sup> *Employment of Tanks with Infantry*, 28-30, 37-41.

<sup>68</sup> *Employment of Tanks with Infantry*, 1-2.

<sup>69</sup> P. A. Devalle, memorandum for Comments Concerning Report of Conference on Tank Matters, 29 June 1945, RG 127, Box 18, NARA; R. L. Hall, memorandum for Tank Conference Report, 8 June 1945, RG 127, Box 18, NARA; G. B. Erskine, memorandum for Tank Conference Report, 22 June 1945, RG 127, Box 18, NARA; and C. A. Laster, memorandum for Communication Comments of Tank Conference Report, 4 June 1945, RG 127, Box 18, NARA.

ers. Reflecting on the employment of tanks in World War I, the utilization of tanks for the Marine Corps throughout the Pacific showed some strikingly similar characteristics to the use of tanks on the western front. Tanks were used in a direct support role for infantry assaulting a heavily entrenched enemy.<sup>70</sup> They provided protection, maneuverability, and counterattack forces that supplemented the main assault.

While Marine Corps tank doctrine changed between 1942 and 1945, it was clear that its foundation lies in the U.S. Army Armor School. The catalysts that drove the realization that Army doctrine was flawed in the use of tanks for the Marines were the lessons learned by the 2d Marine Division on Tarawa in 1943. The 2d Marine Division received a harsh and tragic education on the beaches of Betio, and it had a tremendous effect on strategic-level leaders in the Marine Corps and the Army. The primary lessons from Tarawa included enhancing communication and maneuver

techniques for tank-infantry units, reorganizing and utilizing special equipment like the flamethrower and bulldozer to augment the mobility and effectiveness of tanks, and the overall need for improved rehearsals and training.

The doctrine created during the interwar period overlooked critical vulnerabilities for armor supporting amphibious operations. The Marine Corps focused primarily on developing amphibious doctrine to allow infantry to efficiently assault a beach and thereby failed to synthesize the Army's tank doctrine and apply it to Marine Corps operations. The impact that the short, violent Battle of Tarawa had on tank-infantry operations is captured in the tank matters conference and the postwar *Amphibious Operations: Employment of Tanks*, Phib-18, Marine Corps doctrine published in 1946. The modifications to doctrine were a valuable correction to the flaws of the *Tentative Landing Operations Manual* of 1934.

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<sup>70</sup> Osterhout, "Tanks," 271-72.