

Marine Corps Engineer School

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Engineers,

The past six months have gone by quickly and the Engineer and Utilities Community continues to evolve and prepare for "What's next." This edition of the Operational Engineer Newsletter focuses on amphibiosity, centered on the recent Mine Countermeasures (MCM) Demonstration training exercise conducted off the coast of North Carolina and across Onslow Beach at Camp Lejeune. Our Commandant has identified Naval Integration as one of his priorities and the MCM Demonstration accomplished this through embarkation of Marines and conduct of an amphibious landing focused on moving from ship-to-shore and across an obstacle-laden beach. 2d Combat Engineer Battalion played a key role in the exercise and you will find their After Action Report in this Newsletter. Some interesting challenges were identified that will need to be addressed as we move into the future. Interestingly, many of these challenges remain the same as ones we faced over a decade ago in similar exercises.

Marine Corps Engineer School (MCES) remains committed to several initiatives and focus areas:

-Training and Readiness Manual Working Group: This Working Group is tasked with conducting a two-year Proof of Concept to improve the process of updating our T&R Manual. We appreciate all of the inputs and support from the I&L Advocate, Operating Forces, Supporting Establishment, other Formal Learning Centers, and Training Command and TECOM as we work through updating the Engineer and Utilities T&R Manual in conjunction with a continuous cycle of Course Content Review Boards. Thus far, we have been able to update and improve the courses for Basic Combat Engineers, Small Craft Mechanics, Combat Engineer Platoon Sergeants, Combat Engineer Operations Chiefs, Assault Breacher Operators, and Combat Engineer Officers.

-MCES is committed to ensuring the establishment of an enduring Service-level Counter IED Defeat the Device training program. Our efforts focus on maintaining an already well-developed and mature program that trains all Marines, not just Engineers. Last year the program trained over 40,000 Marines, primarily using the Home Station Training Lane facilities at Camp Lejeune, Camp Pendleton, and Twentynine Palms. The end-state is a program funded through the baseline Marine Corps budget to ensure continued support to all Marines. IEDs are a threat that cannot be wished-away, it is a cheap and easily employed weapon used by our enemies and we must be prepared to deal with the challenges.

-Our instructors continue to excel as they train and prepare Marines for duty in the OpFor as Combat Engineers, Electricians, Generator Mechanics, Refrigeration and Air Conditioning Technicians, Small Craft Mechanics, Water Support Technicians, Utilities Officers, and Combat Engineer Officers. MCES instructors are top-notch and receive a lot of training in preparation to get on "the platform" and teach, and we are proud of the instructor cadre. I highly encourage all Engineer and Utilities Marines to come and teach at MCES – you will leave here as a better subject matter expert and will make a lasting impact on our Community. If interested, contact the relevant Academics Chief at either Combat Engineer Instruction Company or Utilities Instruction Company and let them know you are interested --- they will help you work through our instructor screening package.

-I talk to New-Joins every Friday morning and during my discussion I continually reinforce how fortunate they are to have been assigned to the greatest MOS in the Marine Corps, whether Combat Engineer or Utilities. What we bring to the fight, during either peacetime or war, is vital to the success of the Marine Corps. I must admit I reenergize myself when talking to them because it reminds me that so many of the things we do save lives and improve conditions. We must always be ready to execute our mission flawlessly because so many others are counting upon us to do so. I salute everyone for all you do. For those who do not know, Colonel Dan O'Hora will replace me at your Engineer School this coming summer and will undoubtedly take MCES to the next level. Until then I look forward to continuing to serve you in any way necessary. Never hesitate to call us and we will immediately turn our full attention to your needs.

Semper Fidelis and Engineers Up!

Colonel S. A. Baldwin

Commanding Officer, Marine Corps Engineer School

Capable but Limited: Operational Lessons Learned from the Mine Counter Measure Demonstration

Maj Marcus Gillett – Operations Officer, 2d Combat Engineer Battalion (CEB)

Amphibious operations, and more specifically amphibious breaching operations, are a skill that has atrophied in the Engineer Community, and Marine Corps as a whole, over the past twelve years. Training, equipping, doctrinal analysis, and doctrinal modifications is something that has simply not occurred as the institution focused on land warfare in South and Southwest Asia. In August 2015, 2d Combat Engineer Battalion was tasked as the 2d Marine Division lead planner in support of the Mine Counter Measure (MCM) Demonstration assigned to II MEF by Marine Forces Command and, as such, began planning for the execution of the operation in October 2015. The MCM Demonstration was successfully executed on 30 October 2015 by conducting a limited scope amphibious breach utilizing integrated Naval and Marine Corps Forces in vicinity of South Onslow Beach, Camp Lejeune, North Carolina. Despite the exercise's limited scope, it demonstrated gaps in doctrine, equipment, range facilities, and training for engineer forces when conducting amphibious breaching operations.



2d Combat Engineer Battalion has conducted numerous proof-of-concept exercises with its Assault Breacher Vehicles (ABV) and route clearance equipment throughout 2015. In February 2015, the battalion embarked a Buffalo and two Husky vehicles aboard the USS San Antonio (LPD) via LCAC and in, May 2015, the battalion embarked, again via LCAC, an ABV aboard the USS Wasp. These exercises demonstrated capacity and equipment limitations, but the MCM Demonstration showcased limitations more acutely due to the tactical challenges associated with the complexity of the exercise, despite the demonstration's limited scope.

One of the greatest geographic points of contention and challenges during amphibious breach operations is the surf zone. Currently, the Navy does not possess the capability to sweep and clear the surf zone and is thus limited to the very shallow water and deeper. While the Marine Corps does not typically have the doctrinal responsibility to clear the surf zone,

as it typically falls short of the demarcation line, the institution also lacks the capability to conduct clearance of surf zone. The MCM Demonstration addressed the surf zone through the notional application of the Joint Direct Attack Munition Assault Breaching System (JABS). The two primary employment considerations identified during the planning of the exercise were, first the planning group largely approached the employment of the JABS from the standpoint of utilizing it as an area saturation weapon system where a majority of the surf zone and beach would be cleared utilizing the JABS. Following the demonstration, further research was conducted and it was determined that area employment of the JABS was unfeasible due to the quantity of ordinance required to clear the area. This first point implies that the breach force must conduct detailed planning and the JABS must be employed as a point weapon where only specific areas are cleared to allow a lodgment to be established and additional areas will require clearance by other means.

The second point regarding the JABS is that the joint force does not possess a redundant system that is capable of breaching the surf zone. This point fundamentally leaves the institution with a single point of failure should the JABS be infeasible or ineffective. This fact limits friendly forces and offers adversaries an opportunity to severely impact the options of the joint force when conducting forcible entry operations. In addition, this lack of capability to address the surf zone implies that, even should a lodgment be established, the landing force will be forced to continue utilizing the limited geographic space cleared and thus enabling the enemies targeting process to be much more precise. The surf zone has been and will continue to be an extremely challenging geographic obstacle, due to the nature of the area, but it must be addressed at the institutional and joint level.

The most pressing gap in engineer equipment that was encountered was the inability to embark the ABV with Full Width Mine Plow (FWMP) aboard the LCU due to the FWMP being two inches too wide, even with the wings detached. The doctrinal implication of this equipment gap is the ABV with a FWMP attachment is incapable of being a first wave mechanical proofing asset during the conduct of an amphibious breach. This gap has a twofold implication that impacts the engineer community's ability to support maneuver. First, on the beachhead the ABV is incapable of being utilized to its full potential and force planners to utilize equipment that is less versatile to provide mechanical proofing capability during the conduct of the breach. This has the potential to reduce tempo as additional, less capable assets are employed in roles that they were not designed to conduct. Second, the inability to maximize the usage of the ABV has implications as the MAGTF maneuvers inland, in that, this capability will not be available until the beach is able to receive LCAC's. Again, this is a threat to friendly tempo and reduces the options available to engineer forces to enable the ground combat element to project combat power inland.

The second gap identified that impacts the ability of the MAGTF to conduct sustained operations ashore is the inability to embark engineer route clearance equipment aboard naval shipping. The inability to embark this equipment impacts the MAGTF at the Marine Expeditionary Unit (MEU) level most profoundly, in that, MEU's are deployed without an organic route clearance capability. However, when looking at this gap through the lens of amphibious operations ashore, the inability

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Capable (cont.)

to embark route clearance equipment severely limits the ability of engineers to support mobility operations for the MAGTF until a port facility for shipping is seized and made operational. Thus, the inability to embark the ABV aboard the LCU and the inability to embark route clearance equipment aboard naval amphibious shipping represent two gaps which were identified and validated during the MCM Demonstration. These gaps have institutional implications to the Marine Corps and present a challenge to the engineer community during amphibious operations ashore. The recommended corrective action is, in the case of the ABV FWMP, that the attachment be modified to allow the capability of embarking the asset aboard an LCU, thus making it a first wave asset. With regards to route clearance, the recommendation is further exploration, testing, and acquisition of light weight, scalable mounted route clearance equipment capable of embarkation aboard naval shipping. Addressing of these equipment shortfalls will make the engineer force more capable of both amphibious breaching and the conduct of mobility operations ashore.



The MCM Demonstration also demonstrated a gap in the capability of the Marine Corps to conduct realistic amphibious breach training on the East Coast. Limitations of Onslow Beach included, extremely limited maneuver space due to geographic and environmental restrictions, inability to conduct live fire due to the proximity of both the Onslow Beach recreational area and the intercoastal waterway, and inability to incorporate naval gun fire support or live fire close air support into the exercise due to geographic and range restrictions. These restrictions inherently limit both the size and scope of amphibious operations at Onslow Beach. During the planning phase of the demonstration, in July 2015, the planning team conducted an analysis of multiple locations in the local area, none of which enabled full spectrum amphibious breach operations. For the engineer community, this lack of training venues impacts the community's ability to conduct combined arms amphibious breach operations and impacts sustainment of this capability.

The final operational gap that was identified during the MCM Demonstration was training for both Marine Corps and Naval Forces. Within 2d Combat Engineer Battalion only the three most senior members of the battalion staff had conducted amphibious operations previously in their career. This means that .04 percent of the battalion had previous experience of engineer operations in an amphibious environment. While the staff largely overcame this experience gap utilizing doctrinal

publications, Marine Corps Engineer School, and the 22d MEU staff, it represents a fundamental training shortfall within what is one of Combat Engineer Battalions core mission essential tasks.

In addition, throughout the planning and execution phases there was a clear lack of interoperability between the Navy and Marine Corps based on the fact that joint operations had not been conducted in a long period of time. Misunderstandings regarding unit employment, equipment capabilities, mission requirements, and other aspects of the operation were prevalent throughout the planning process and resulted in friction during critical periods that was simply based on the fact that this type of operation had not been conducted in more than ten years. While ship services are routine at Camp Lejeune, these are restricted to what amount to administrative embarkation and debarkation of personnel and equipment. When faced with a tactical scenario or exercise the unfamiliarity of each unit's unique requirements between both services became clear and represents a gap that can easily be overcome with future emphasis on these types of operations.

Thus, while the MCM Demonstration fulfilled the commander's intent for the exercise it exposed several institutional level challenges that will determine the capability of the force to conduct amphibious breaching in the future. These challenges included the joint forces ability to breach the surf zone, equipment limitations, range constraints, and training shortfalls between the Marine Corps and Navy. These are challenges that the engineer community and Marine Corps as a whole must continue to address as amphibious breaching operations are an essential capability through the institutional and strategic lens.



Q: What is an "ICD"?

A: *An Initial Capabilities Document (ICD) codifies the requirement for a solution to a specific capability gap. Solutions may be material, non-material or a combination of the two. It defines the capability gap in terms of the functional area, the relevant ROMO, desired effects and time, the DOTMLPF analysis and describes why non-materiel changes alone have been judged inadequate in fully providing the capability.*

(Source: DAU)

The Elephant on the Beach: Amphibious Mine Counter-Measure Capability Gaps

**GySgt Jonathan Damren – Requirements Analyst,
Capabilities Branch – MCES**

From day one, we are taught that Marines are amphibious by nature; it is one of the reasons that the Continental Congress decided that America should have a Corps of Marines. Quite simply, it's what we do. That may have been true in 1775, but is it still accurate today? Can we really "maneuver ashore at the time and place" of our choosing? In 1995, we conducted something called the Mission Area Analysis (MAA) of Mission Area 26 – Engineering, similar to what we now call a Capabilities Based Assessment. During that MAA, it was determined that the 31 deficiency for Engineers was "The MAGTF has an inadequate capability to perform forcible entry from the sea in a mine environment. Landing forces must rely on 1950/60s mechanical and explosive technology." In 20 years, not much has changed. Our amphibious mine countermeasures (MCM) capabilities are dated, unreliable, and ineffective.

It can be said that the 1995 MAA was not published in vain, though. It's likely that our Assault Breacher Vehicle (ABV) was developed as a result. While developing the requirement for the ABV, the Navy had made public their decision to sundown their aging fleet of Landing Craft, Utility (LCU) in favor of the faster Landing Craft, Air Cushion (LCAC). Because of this decision, the design parameter stated that the "ABV with the FWMP (Full Width Mine Plow) installed must be capable of traversing a 15 degree ramp in amphibious ships and traverse from that ramp onto a Landing Craft Air Cushion (LCAC) without dunnage." (Operational Requirements Document for the ABV, 6 May 2002) Apparently, the Navy then realized that the LCAC was too vulnerable to be included in the initial waves of an amphibious assault, and the LCU must be retained in order to transport our less-than-amphibious equipment to the beach that would be required during the initial waves of the assault. Herein lies the conundrum: an LCAC requires a proofed Craft Landing Zone (CLZ) and secured beachhead in order to land, and our proofing asset will only fit on an LCAC. This capability gap was identified, once again, on the Program Objective Memorandum 2018 (POM-18) Marine Corps Gap List at number 124: "Capability to proof assault lanes and craft landing zones during amphibious operations in order to ensure protection and freedom of maneuver."

Knowing our MCM capability gaps, 2d Combat Engineer Battalion (CEB) recently set out to prove that we can, in fact, proof an assault lane or CLZ on a beach. Tasked by Marine Forces Command (MFC) through II Marine Expeditionary Force (II MEF), 2d CEB conducted an MCM demonstration at Onslow Beach. Looking at their available MCM capable equipment versus the limitations of Navy connectors, they improvised, adapted, and overcame the problems...somewhat. Since an ABV could not be embarked aboard an LCU with a FWMP, 2d CEB sourced an alternate means of proofing to perform the task.

In 1949, a full width mine rake was patented (US Patent # 2486372) for use on a Main Battle Tank. This rake was adapted several times; notably in 1991 for use on the M60 tank

and D7 bulldozer for use in Desert Storm/Desert Shield and again for the MCT for use during Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). The rakes remaining from these conflicts are awaiting disposition at MCLB Albany, GA. 2d CEB realized this could be a potential solution to performing the task to proof assault lanes and had the rakes modified once again; this time with a fresh coat of green paint and 1 foot less of width on either side to fit on the LCU. Rakes were delivered, fitted on bulldozers, lanes and CLZs were proofed, and lessons were learned.



An ABV with combat dozer blade and an MCT with a mine rake embarked on an LCU.

The limitations of the MCT included its speed, communications suites, navigation capability, and mine-resistant armor. Perhaps most notably, the biggest drawback of using an MCT during a breaching operation is – it's a commercial bulldozer! Breaching with an MCT is akin to driving a nail with a skillet, it'll probably get done, but not without some cursing and some pain. We don't need to armor a bulldozer; it should be conducting construction and general engineering operations protected by a defense force. Moreover, the only communication or navigation suite a bulldozer needs is the ground guide on the deck, pointing and waving. What we need is a tool designed for the job. To sufficiently perform mobility tasks to breach, proof, and mark assault lanes during an amphibious assault, we have the following needs:

- We need a proofing asset capable of keeping pace with the maneuver element, which we have in the ABV with FWMP. We need this vehicle to fit on the LCU, or any other ship-to-shore connector the Navy may develop.
- We need an explosive breaching asset that is reliable and effective; our current M58 Mine Clearing Linear Charge (MICLEIC) and Mk22 rocket is based on 60-year-old technology, equivalent to fighting in the Vietnam War with weapons from pre-World War I. If our service rifle failed as often as the M58, I'm sure we would demand a new one. Nevertheless, the failure rate of the MICLEIC is inexplicably accepted.
- We need a breaching asset capable of reducing non-explosive obstacles and keeping pace with the maneuver element, which we have in the ABV with combat dozer blade.

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Elephant (cont.)

- We need an earthmoving asset capable of breaching tank ditches and berms and keeping pace with the maneuver element, which we have in the M9 Armored Combat Earthmover (ACE). The M9 ACE recently underwent some upgrades to improve its dated and inadequate capabilities, so it remains to be seen whether it is up to the task for this mission.
- We need a modern assault bridging capability, currently provided by the Armored Vehicle Launched Bridge (AVLB) on an M60 chassis, which is unable to maintain pace with our current armored and mechanized forces and whose age renders its teetering on the brink of obsolescence as parts production lines shut down and maintenance becomes more and more challenging.
- We need to group these assets and their operators as one cohesive unit, possibly in the Mobility Assault Company of the CEB.
- We need to train to a standard in the ability to embark and deploy these assets from ship-to-shore connectors. If Navy assets are not available to conduct this training, we need to construct surrogate naval vessels on Marine bases in order to maintain our readiness.
- We need a range co-located with every major subordinate command on which this training can be conducted; namely actual beaches where Marines can move dirt with plows and detonate explosives.



An Amphibious Assault Vehicle fires the Mk22 rocket and M58 line charge using the Mk154 launching mechanism.

While I chose to focus this article on existing gaps in combat engineering capabilities, several other gaps exist in the undertaking of amphibious operations in an area-denial environment. Captain Sir B.H. Liddell-Hart, renowned English soldier and military historian, once said "A landing on a foreign coast in the face of hostile troops has always been one of the most difficult operations of war." Adopting an over-the-horizon capability adds an entirely different set of challenges. However, according to General Douglas MacArthur, "Amphibious landing is the most powerful tool we have." Given the current trend of human migration to littoral urban areas, the need to retain the capability becomes even more apparent. As sustained operations in Iraq and Afghanistan wind to a close, the Marine Corps must return to its roots as an amphibious force and America's Expeditionary Force in Readiness, and

engineers must be trained, organized, and equipped to provide the mobility support, from the sea, that our Corps expects.



MCT mine rake after breaching operations with log obstacle remnants lodged in the teeth.



Seven Lessons Learned from a 1302 Lieutenant

1st Lt. William Wyper-Bulk Fuel Company, 7th Engineer Support Battalion

As with many new 1302s, I knew that there was a vast range of possible billet assignments for me in the operating forces. My internal ranking of the possibilities put Combat Engineer Battalion at the top of my preferences, with Engineer Support Battalion next, followed by the Marine Wing Support Squadron. I wanted to be a Platoon Commander where I could do the cool things that engineers do: blow stuff up, shoot things, and support an infantry scheme of maneuver. I did not get my first pick – far from it – but I did get a platoon and enjoyed the valued time I spent with them tremendously. Once I got that platoon, I no longer thought about other opportunities for platoon-level leadership; I had mine and that is exactly what I've always wanted.

The maxim many lieutenants will remember from The Basic School (TBS) and Combat Engineer Officer Course is "bloom where you're planted." This cannot be overstated for several reasons. First, most of us will not always get what we want. Second, regardless of what position you may hold, you will be much happier and capable if you embrace your job. Finally, and most importantly, we owe it to our Marines to do the job we have to the best of our abilities with enthusiasm.

By the time any lieutenant makes it to their first billet, in the fleet, they are well indoctrinated into the idea that a Marine Officer is not a singular job description. At TBS, new officers are introduced to the "MAGTF Officer" concept – the notion that although we all have an MOS, we must be able to fully integrate into the MAGTF as a whole. TBS, as an institution, of course, is unique in that it provides general training in officership that other services do not have; all Marine Officers are trained to be Marine Officers first and foremost with the MOS being in addition to the basics.

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Seven Lessons (cont.)

Moving on to Combat Engineer Officer Course, new engineer officers are further trained in a wide array of engineering. The topics covered in this course are intended to prepare Lieutenants for myriad of possible billets, even briefly covering utilities and bulk fuel. Thus, new engineer officers entering the fleet are trained entirely in the basics of many skills, but not so much in any comprehensive skill-set designed for one specific billet. This model of officer training serves the Marine Corps well, as I have discovered first hand. All Marine Officers are set up to successfully bloom in any position or billet.

Shortly after checking into my first duty station at 7th Engineer Support Battalion, I was assigned to Bulk Fuel Company as a Platoon Commander. What follows is what I learned as a new 1302 in the operating forces while serving as a Platoon Commander in a billet normally held by a 1390 (Bulk Fuel Officer).

Lesson one. Love it. Marines don't volunteer to become Marines to do a specific job. We joined to be Marines. Leading Marines is a position few have sought, and fewer have achieved. Regardless of the specifics of your job as a new lieutenant – or any Marine for that matter – you have an extremely rewarding job. Cherish every moment, especially in a leadership position because it will not last indefinitely. You will not be a Marine forever, but many of us will remember fondly our time spent in the Marine Corps, so make the best of every moment in whatever capacity you serve.

Lesson two. Be humble as you learn the job. This may in fact be easier when put in a billet that is not one you have been trained to fill specifically as you have no basis for arrogance. Nevertheless, it is important. Whatever your job may be and regardless of your level of training for it, you will be expected to learn the job and be able to operate as a leader in your position. Foremost, have a sincere interest in learning about the job; it may not be yours by T/O but it's yours by which to succeed or fail. Take advantage of your subject matter experts, whether they are in charge of you or subordinate to you. Your leaders and subordinates alike will respect the interest you show in learning. Interest is not enough, however. You must read about technical material, get your hands on equipment and understand how it works, how to maintain it, and run through planning scenarios that allow you to put knowledge to practical application. The goal is not to be as technically proficient as a trained subject matter expert, but you must be confident enough to perform your leadership role successfully. Never let inexperience get in the way of your learning based on pride. Successful Lieutenants seek advice, know how to put it to use, and never think they know everything.

Lesson three. Use your staff noncommissioned officers as well. As a new Lieutenant in a specialty I knew little about, my platoon sergeant was my primary subject matter expert when it came to planning exercises, maintaining equipment, and ensuring that my Marines were technically and tactically proficient. This starts with a good working relationship between you and your SNCO. It will take some time to develop a good relationship, but it is an essential part of being successful. Show interest by asking questions about the MOS. This builds rapport. Let them do their job by not micromanaging. Rather than interrogate your SNCO about finite details, that they can handle, ask questions about their methods, both to build a common understanding about how

each other operates and so that you can learn about the MOS. Your SNCOs will respect you if you respect them. Remember they are your sounding board.

Lesson four. Empower the Marines – they know the technical aspects of the job better than you do, until your proficiency grows. This is as much a result of having a leadership position held by a non-subject matter expert as it is something you as the leader must foster. Your Marines will amaze you if given the chance.

You must provide them with the opportunity to succeed and the freedom to fail. When planning exercises, have your key leaders plan technical aspects. You can compare their plans to the technical manuals and discuss differences. Their plan will probably be better than yours. Once you have done several exercises and you understand the planning and execution processes, delegate larger and larger tasks to your Sergeants. This may be uncomfortable for you at first – we like to be in control – but it will provide an important opportunity for you to mentor your NCOs and prepare them for future leadership positions. Task them with things that push their comfort zone too. Set expectations, assign specific tasks and goals, and let them run with it. Always keep your door open for questions and check in with them to see progress. Never fire and forget. They will amaze you!

Lesson five. Know your bubble. This advice pertains to all billets, albeit there are some specific ways it is important when in a position unfamiliar to you. In general, it is advisable to understand your sphere of influence, whatever that may be in your job. As a Platoon Commander you can reduce this sphere for the most part to your platoon. Your Marines, assets, and missions constitute your boundaries. Within the platoon you as the leader have a more unique bubble. Though this bubble within the platoon can be as big as you want it to be, you must temper it against your key leadership and the roles they perform. If you make your bubble so all-encompassing that you take their jobs away from them, then you risk alienating the Marines you rely on to help run the platoon.

If you are in a billet outside of your MOS, there are additional considerations. As a 1302, I never set the goal for myself of actually being a 1390. I would learn my job to be able to do it successfully, but I was no subject matter expert. My sphere was the platoon leader, responsible for – among all other responsibilities – ensuring my Marines were being trained in their MOS. To this end, I was a facilitator who, lacking the training to be the primary instructor on technical MOS skills, ensured training was planned and accomplished to the standards. If you misjudge or overly expand your sphere, you will end up degrading the quality of your subordinates work.

Just as important as knowing the limit of your sphere of influence is protecting what is in your sphere. There are some things that belong to the leader and to the leader alone. The welfare, development, and discipline of your Marines are your responsibility. Nobody can take your decision making responsibility away from you in these regards. Therefore, it is just as important to know what is yours. If your bubble is encroached on be able to recognize this and have the courage to defend it.

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Seven Lessons (cont.)

Lesson six. Learn how to work with other Marines. A large part of this goes back to knowing your bubble, and certainly to having humility. As a 1390 billet holder I had at all times a company executive officer who was a Chief Warrant Officer and, at times, a company commander of the same rank. Some Marines seem astonished when they hear this, as if pride would prevent a functioning and successful working relationship. My Chief Warrant Officers respected and mentored me and at times I was able to mentor them as well. Every billet has a role. Learn to do yours with the support of and to support your fellow leaders. If you have trouble working for someone, then communicate. Talk to them and work it out, or just get over yourself. As a new lieutenant you are highly trained, but still inherently lack credible MOS experience. Don't become the barrier to your own work.

Working with your subordinates is equally as important as working with peers or your leadership. Again, this goes back to humility and understanding your bubble, or, moreover, knowing your subordinates' bubbles. Let your key leaders do their jobs, unless they prove incompetent or otherwise unworthy. Get to know your subordinates and let them get to know you. Don't be standoffish. Learn how they operate and think so that you can provide intent and guidance that enables them to succeed, rather than give them a sense of distrust among their leadership.

Lesson seven. Finally, as a new Lieutenant, you are highly trained and immensely capable. Put your training to work. You do, of course, lack experience in your MOS, but that can be learned. The 'basic' and broad training you have received in Quantico and Courthouse Bay has set you up for success in any billet you find yourself in. Recognize what you know; it will guide you in the right direction. Recognize what you don't; your subordinates have more experience than you do. If you find a balance between the two – what you do and do not know – you will be successful. Finding this balance is a careful process that you cannot take lightly. Your training is based on doctrine, and doctrine is not an equation for success; it is a concept to get you there. You know the basics, but never get in the habit of mind, that the book is a full replacement for experience. Experience, on the other hand, does not mean something is right. Your Marine's experience is valuable – it may get you out of tough situations – but it can be formed of bad habits. The see-saw of what you know and don't know and your training versus your Marines' experience is something you must grasp. Your ability to make a good decision depends on it. You are well trained and fully capable, but you know the limits and know what to do with the tools in your kit.

I was a Bulk Fuel Platoon Commander for nine months. I learned more than I could have imagined about leading Marines – not to mention bulk fuel capabilities. These are some of the key lessons that I have learned along the way. They may serve some of you well in the future, no matter the unit you serve or the billet you hold. Be humble and bloom where you're planted.



MCES Implements MOS Specific Physical Standards

LtCol Taylor White-Combat Engineer Instruction Company, MCES

The Commanding General (CG), Marine Corps Combat Development Command (MCCDC) tasked CG, Training and Education Command (TECOM) to develop gender neutral Military Occupational Specialty (MOS) Specific Physical Standards (MSPS) for the specified enlisted MOSs of: 0311, 0313, 03121, 0331, 0341, 0351, 0352, 0811, 0842, 0844, 0847, 0861, 1371, 1812, 1833, 2131, 2141, 2146, 2147, and 7212. Specified Officer MOSs are 0302, 0303, 0307, 0802, 1302, 1802, 1803, and 7204. On 29 September 2015, CG Training Command directed implementation of MSPS for all affected Programs of Instruction (POI) with classes convening in the Fiscal Year 2016 (FY16).

MCES executes two MSOS affected POI, the Basic Combat Engineer (BCE) and Combat Engineer Officer (CEO) courses. The BCE course averages 30 Marines per class, and 30 classes per year for a throughput of approximately 900 Marine students trained annually. The CEO course has an average of 10 Officers per class at seven classes per year, for an annual throughput of approximately 70. Both courses incorporated MSPS into the existing POI on 1 October 2015 as requirements to earn the 1302 or 1371 MOSs. MCES executed the first MSPS evaluation on 23 October 2015.

The MSPS events for MOSs 1371 and 1302 are identical and comprised of two common skills MSPS events and three Combat Engineer MSPS events.

The common skills tasks are:

- **Mk-19 Lift:** Perform a single lift of a mock-up Mk-19 from ground to overhead wearing a fighting load.
- **Casualty Drag:** Run/Rush 25 meters to casualty position and recover a 214 lbs mannequin to the starting position within 54 seconds wearing the fighting load.

The Combat Engineer tasks are:

- **APOBS Rush:** Run/Rush 150 meters in under 1:12 while wearing the fighting load and carrying a simulated APOBS pack. Fighting load is 54.35 lbs; pack is 72 lbs.
- **Mechanical Breach:** Breach door with battering ram with no more than 5 strikes in 30 seconds while wearing the fighting load.
- **Simulated HESCO Lift:** Clean and press an Olympic bar with plates totaling 100 lbs overhead, for one repetition.

Marines must master all five events during the POI to earn the appropriate MOS. During the BCE POI, Marines will be afforded three attempts to demonstrate mastery. If a Marine has not demonstrated mastery in any of the five events at the end of the six-week BCE POI, that Marine will be recycled to a subsequent class iterations and afforded up to three additional attempts for a total of six.

Continued on page 8.

MSPS (cont.)

Within the CEO POI, Marines will be afforded all six attempts within their respective class due to the length of the course (approximately four and a half months long). If any Marine in either affected POI fails to master any event after six total attempts, that Marine will be reclassified to another non-MSPS affected MOS.

Currently, MCES tests all five MSPS tasks during one collective MSPS evaluation period for individual BCE or CEO classes. The tasks are sequenced as in the following order: HESCO Lift; Mk19 lift; Casualty Drag; Breach; APOBS Rush. MCES tests during non-academic time, taking advantage of instructor training days and scheduled physical training. Over the next six months, MCES will add MSPS testing to each affected POI, likely increasing course length to accommodate three tests per BCE class, and six tests per CEO class.

MCES has completed MSPS testing of five Basic Combat Engineer Classes and two Combat Engineer Officer classes since 1 October 2015, testing 153 enlisted Marines and 17 Marine Officers with only 2 enlisted failures. One Marine failed the HESCO lift while the other failed the HESCO and Mk19 lifts, as well as the door breach. These two Marines will be recycled to a subsequent class and provided three additional opportunities over the course of five weeks to master failed events.

Supporting MSPS implementation, the Marine Corps commenced new MOS physical screening requirements in January 2016. The new requirements consist of an enhanced, gender neutral Initial Strength Test (IST) for MSPS affected Program Enlisted For (PEF) codes, Officer selection screening, and an MOS Classification Standard (MCS) that implements minimum gender neutral MOS classification standards in PFT & CFT events to gain assignment to a specific MSPS affected MOS.

- Enlisted Screening Requirements (I ST)
 - 3 pull ups
 - 1.5 mile run <13:30
 - 44 crunches
 - 45 ammo can lifts
- Officer Screening
 - 225 gender normed PFT
- Enlisted and Officer MCS
 - 6 pull ups
 - 3 mile run – 24:51
 - Maneuver Under Fire <3:12
 - Movement to Contact <3:26
 - 60 ammo can lifts

Per MARADMIN 544/15 paragraph 3.b., the 1371 and all 21XX MOSs realigned to a newly established PEF code of "CX" on 1 January 2016. We anticipate MCS-screened Marines will begin to arrive at MCES in April 2016.



Supporting U.S. Marines through Science, Technology Naval Surface Warfare Center-Panama City Division Joint Interoperability and Irregular Warfare Division (Code E20)

PANAMA CITY, Fla – Every time a U.S. Marine or U.S. Navy Sailor breaches the littorals and moves personnel, supplies, or equipment from a ship to a shoreline, a team of technical experts stand proud behind the mission execution.

As a Department of the Navy Center of Innovation, and a Naval Sea Systems Command Warfare Center, the Naval Surface Warfare Center Panama City Division (NSWC PCD)'s amphibious operations and expeditionary maneuver thrust teams today continue to deliver products and services that enable U.S. Marine forces to conduct expeditionary maneuver warfare across the range of military operations.

"Our personnel conduct analysis to support concept development, threat determination, and requirements development. They develop and sustain systems to support command and control, maneuver, logistics and force protection along with ensuring U.S. Marine Corps equipment interfaces with ships and the seabase," said Jeff Dinges, senior systems engineer, NSWC PCD. "As a NAVSEA Warfare Center and a Center for Innovation, it's our jobs to deliver the capabilities our customers in the field need and to ensure they work as intended each and every time."

Using science, engineering, and team logistical support, the NSWC PCD Joint Interoperability and Irregular Warfare Division (Code E20) focuses on delivering analysis, technologies, equipment and systems for maneuver, force protection, and logistics to support the Marine Air Ground Task Force components. The NSWC PCD Team, and their U.S. Marine Corps sponsors, calls this focus an Expeditionary Maneuver thrust.

"The Expeditionary Maneuver thrust also includes expeditionary systems to ship interfaces, breaching systems, surf zone and land mine countermeasures, ship-to-objective maneuver systems and systems engineering and integration," said Dinges.

Examples of capabilities supported by NSWC PCD personnel include developing and sustaining Route Reconnaissance and Clearance equipment and Mobility/Counter mobility equipment. The team has developed and integrated autonomous navigation system, habitability, electrical upgrade, as well as emergency egress lighting and driver visualization modernization capabilities into the Amphibious Assault Vehicle (AAV).

"We are also working with expeditionary energy efforts including hybrid systems, shelter modeling and testing, vehicle fuel monitoring and vehicle fuel efficiency projects," said Dinges. "NSWC Panama City Division has unique facilities that include Gulf of Mexico and riverine access available for system tests and evaluations."

Continued on page 9.

Science (cont.)

NSWC PCD's research, development, test and evaluation (RDT&E) capabilities include explosive test ponds, tactical vehicle mobility, endurance, and effectiveness test ranges, handheld detector test & training ranges, foreign target exploitation facility, 3D modeling & laser scanning center, environmental impact statement (EIS) allowing beach amphibious landings & explosive, beach assaults, expeditionary energy evaluation & integration site, LCAC maintenance and operations facilities. Together, these tools enable NSWC PCD's scientists, engineers, and logisticians to help develop tomorrow's capabilities for the Department of the Navy's expeditionary personnel.

"Our personnel have in-depth knowledge of Navy and Marine Corps missions and operations. Our command at its present location has been supporting expeditionary and Naval Special Warfare operations since the 1950s, so we have the ability to capitalize on decades of lessons learned and Fleet experiences," he said.

NSWC PCD's expeditionary and maneuver systems experts also have heavy vehicle design experience, expertise in ship to objective systems development, Anti-Access/Area Denial expertise, and extensive experience in Counter IED technologies, the latest applications of 3D laser modeling, and experience in land mine countermeasure and obstacle breaching. They are explosive certified testers, qualified vehicle operators, system engineers who understand how to integrate new technologies into USMC vehicle.

"We also have experience in instrumenting and modeling for human shock, design, analysis, interoperability, system engineering and integration in transition from ship to objectives, transportability certification for USMC vehicles via air, land, rail, landing craft, and ships, design and analysis for magnetic operations, 3D CAD modeling, finite element analysis and air cushion vehicle operations and integration," said Dinges. "Bottom line is that we love to support these ground forces. We have the expertise, and we want to remain the innovative technical center of excellence the U.S. Marine Corps goes to when they need to develop a new capability or to modernize and existing one. Going somewhere else for these specific requirements would be like disregarding 70 years of ingenuity."

NSWC PCD is working continuously to improve materiel solutions that enable U.S. Marine forces to conduct Expeditionary Maneuver Warfare across the range of military operations along with ensuring Marine Forces have the materiel solutions to perform Expeditionary Crisis Response from/to the Seabase or Amphibious ship-to-objective.

NSWC PCD: Technical Center of Excellence for Littoral Warfare and Coastal Defense



Joint Direct Attack Munition Breaching System (JABS) Capability

Mine Countermeasures (MCM) in Support of Amphibious Operations, NTP 3-15.24/MCRP 3-31.2A

JABS, employing the 2,000 lbs Mk84 JDAM is currently the most effective and viable capability available to breach assault lanes from the surf zone (SZ) through the beach exit and craft landing zones (CLZ). Because each JABS munition targets a specific obstacle, its employment requires high volume weapons delivery, making Air Force extended range aircraft the preferred delivery platforms. A memorandum of agreement (MOA) between the Departments of the Navy and Air Force specifies the inter-Service support relationship for the Air Force bomber (B-1, B-2, and B-52) aircraft and certain Navy aircraft in support of amphibious operations.



USAF B-52H Stratofortress delivering a 2,000 lbs GBU-31 Mk 84 JDAM

The location of mines, obstacle belts, and mine lines is critical to the development of the ship-to-shore movement and overall landing plans and a target list for JABS. The Coastal Battlefield Reconnaissance and Analysis (COBRA) system is a key element in successful intelligence, surveillance, and reconnaissance (ISR) efforts for MCM in support of amphibious operations.

COBRA Block I Initial Operating Capability (IOC), currently scheduled for mid FY 17, is a clandestine airborne capability providing rapid tactical reconnaissance of the littoral area for minefield and obstacle detection. It *will be* organic to the fleet as part of the Littoral Combat Ship (LCS) Mine Warfare mission module, and will be carried by the MQ-8B "FIRESOULT" Vertical Takeoff and Landing Unmanned Aerial Vehicle (VTUAV).

COBRA Block I capabilities will be limited to: 1) Daytime operations, 2) limited capability to detect surface-laid mine line and obstacles in the SZ and BZ, 3) Post-mission analysis (PMA). No data link capability for sensor data in Block I.

Continued on page 10.



To support targeting package development, COBRA imagery exploitation is required by trained personnel once the mission has been completed and the UAS has returned to the originating location. Information gathered from COBRA may help verify adversary intentions, plans, and defensive strength, and may assist commanders determine the best combination of breaching and clearing TTP.

Presently, there is no means to mark the area where a JABS breach actually occurs as opposed to the intended area to be breached. Assault vehicles and landing craft in the initial assault will be provided the intended assault lane coordinates during the pre-assault briefings prior to launch and directed to the intended landing sites by the Navy control group during the ship-to-shore movement.

Detailed JABS planning and execution information may be found in the reference.



Marine Corps Engineer Association (MCEA)

What is it? MCEA is a HQMC sanctioned, tax-exempt, nonprofit organization, incorporated in NC, in 1991. MCEA provides a unique opportunity to connect or reconnect and maintain communication with Marine Corps engineers, the Marine Corps family, recognize outstanding performance of individual Marines and engineer and Seabee organizations, and to leave a memorable legacy of our Marine Corps engineer brotherhood.

MCEA Purpose/Bylaw highlights:

- Promote Marine Corps engineering in combat engineer, engineer equipment, utilities, landing support (shore party), bulk fuel, topographic and construction engineering, drafting, and Explosive Ordnance Disposal (EOD); Promote an accurate historical record of Marine Corps engineer contributions
- Renew and perpetuate fellowship of retired, former and current US Marines who served with Marine Corps Engineer units and sister service members who served in support of Marine-Air-Ground Task Forces (MAGTFs); foster solidarity of Marine Corps engineers
- Keep members current with the Marine Corps engineer community

- Annually recognize superior achievement of active duty and reserve establishment Marine Corps EOD and engineer individuals & organizations, as well as Naval Construction Force Units
- Provide Financial Assistance to Marines, their next of kin or other deserving personnel

MCEA Eligibility. All former and current Armed Forces personnel who served with Marine Corps Air Ground Task Force (MAGTF) Units or in support of Marine Corps Engineer Units or US Marine Corps Base and Station billets.

Membership Benefits:

- Very affordable membership dues! 100% of dues and contributions tax deductible
- Contributions to MCEA, Assistance Fund and Engineer Monument Fund qualify for Fellows Program
- Access to members' roster and capability to locate and reconnect with Marines and Sailors
- Annual reunion with opportunity to interact with veterans as well as active/reserve duty personnel, corporate members and "Best of the Best" award recipients and their families
- Availability of the MCEA Financial Assistance Fund
- Subscription to MCEA newsletter; unlimited access to website and special "members only" section
- Notification of employment opportunities especially in the DOD and civilian engineering community
- Access to history, lineage and other information about USMC engineer units
- Availability of unique MCEA Ship's Store items; discounts on Military Historical Tours, Inc.
- Exclusive assistance from Ingenieur Executive Company for job and contract placement
- Special partner-association pricing on Marine Corps Association membership
- Discount prices on Society of American Military Engineers courses

MCEA: 807 Carriage Hills Blvd, Conroe, TX 77384; Phone #: 936-273-4830, www.marcorengasn.org



MCEA Engineer Monument

Dedicated 14 May 2014, as an enduring tribute to all Marine Corps Engineers, past, present and future in the Semper Fidelis Park at the National Museum of the Marine Corps. Personalized and unit bricks available for purchase to be located adjacent to our Engineer Monument. Make it a point to visit the monument if you are at the museum. Maps, brick order forms and all the details are on our website: <http://www.marcorengasn.org/modules/Monument/brickprogram.htm>

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Purpose

The purpose of the *Operational Engineer* is to provide a useful forum for open discussion and free exchange of ideas relating to the U.S. Marine Corps Engineer community. Thoughts, suggestions and ideas from all are essential to achieving this purpose.

Submissions

Provide submissions via email (preferred) or regular mail, please include contact information. Feel free to submit:

- Commentary on published material
- Articles dealing with topics of interest to the Engineer community
- Ideas and Issues that could affect or do affect the Engineer community
- Letters to the "editor"

Next Issue

The next issue of the *Operational Engineer* will be published during Spring 2016. To ensure timely publication of your offered content, provide submissions by 15 April 2016.



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