

# Field Level of Maintenance in the Future Operating Environment

Conditioned-base maintenance for the future fight: a case study

by CWO4 John Doreus

**T**he *Commandant's Planning Guidance (CPG)* states,

the Marine Corps is not organized, trained, equipped, or postured to meet the demands of the rapidly evolving future operating environment. This future operating environment will be characterized by peer-to-peer competition with actors who possess the ability to deny and degrade systems and capabilities faster than they can be replaced.

The Marine Corps does not have the appropriate ground maintenance processes in position to sustain the force during global power competition in trans-regional, multi-domain, and multi-functional environments, with readiness trending in the 60 to 70 percent range for mission essential military equipment.

In order to be successful in this future fight, the force must operate in temporary, dispersed, and disaggregated locations while persisting and thriving inside the enemy's weapon engagement zone. Attrition of assets will be high. This warfighting concept inherently requires an optimal state of vehicle readiness. Units operating dispersed and disaggregated will not always have an intermediate maintenance activity proximate to fix vehicles, nor will it be feasible. In many cases, it will be more practical to replace a deadline asset, so units will need to maintain a fleet of

**>CWO4 Doreus is a Motor Transport Officer currently assigned to Combat Logistics Regiment III. He has over 21 years of logistics experience serving with all elements of the MAGTF and Marine Corps Special Operations Command.**

mission capable vehicles. Additionally, commanders cannot have a deadline vehicle be the single point of failure for a mission. There will be a degree of expectation that operators have the training and ability to maintain a basic level of readiness with their weapon system (vehicle), which is no different than how we expect every Marine to maintain their rifle.

The logistics posture of today's force has greatly influenced the ability to provide organic lift. For most units, this is accomplished by motor transport operations; thus, motor transport readiness becomes a center of gravity during operations. The end-to-end logistics transportation required for mission success are the motor transport vehicles, their operators, and maintainers. Those resources ensure mission essential classes of supplies are readily available to the MAGTF at its final destination. The Defense Logistics Agency and other logistics enablers can ship, rail, and aerial deliver items to the warfighter, but the final means of mobility to allow the commander to force the enemy to capitulate requires motor transport. The aviation and naval communities spend

the necessary resources and empower leadership to be precise because the margin for error requires meticulous attention to detail and continuous process improvement. The Marine Corps force structure has reduced manpower but not the equipment, which has bolstered the equipment to maintainer (E2M) ratio. The Marine Corps has limited resources to sustain the motor transport readiness posture that is necessary for the future fight.

Across the conventional Marine Corps, motor transport vehicle readiness is low. Why is vehicles readiness so dismal? The problem is exacerbated by our outdated maintenance processes and legacy maintenance concepts, which are not commensurate with contemporary requirements. The current processes manifested a mentality to order parts without forethought just to drive the process along. The result is an amalgamation of equipment, continuous reapplication of parts, repeat diagnostics, and repetition of this cycle only to satisfy timelines and readiness requirements. A lack of knowledge, outdated task organization, and lack of prioritization on maintenance all attribute

the current problem of maintaining a high readiness state. The aviation and naval communities have a dedicated process improvement office to implement changes rapidly, and the resources to foster creativity and encourage leadership to not let processes impede efficiency. The Marine Corps has adopted Global Combat Service Support-Marine Corps to manage legacy maintenance concepts. *MCDP 1* and the *CPG* require the Marine Corps to adapt to the ever-changing environment, but the Corps does not have the time and space to successfully implement this solution across the force. Creative thinking is required to maneuver through this problem set.

Condition-based maintenance (CBM) is a maintenance strategy that monitors the actual condition of an asset in order to prioritize maintenance requirements. This is contrary to the current scheduled process, where even if a vehicle is only driven nineteen miles annually, it will undergo yearly maintenance to have items exchanged and parts replaced. In some cases, the rigidity of the schedule causes more damage to the equipment based on the level of proficiency of the mechanic conducting the repairs. This current model counts on the maintainer to be a “jack of all trades” and own the supply, maintenance management, and technical processes. The operator, who has no ownership of the equipment and no standard for its level of care, is led to place the burden of routine maintenance (e.g. replace a headlight, windshield wiper, tire, or a belt) on the maintainer. This process is inefficient.

In the future fight against a near-peer threat, we no longer will dictate the operating tempo of the fight—a luxury we have enjoyed throughout history. We will need to move fast through time and space in order to gain an operational advantage. Maintenance is a tedious process, so it is not practical in a trans-regional, multi-domain, and multi-functional environment. The mission-essential maintenance will need to be proactive and executed initially, concurrently, and ad-hoc, so that vehicle readiness is at its utmost state. Henceforth, when vehicles are deadline, an operator is able to bring the vehicle to a

degraded status or replace it, as opposed to relying solely on the maintainer. Operators will be trained to perform preventive and corrective maintenance to a certain degree, just like a person would for their personal vehicle. Thus, when a vehicle goes down during a mission, we reduce the chance that it becomes a single point of failure. The return on investment is not economical or practical when vehicles must be sent back to “the rear” to get repaired. The current *Marine Corps Order 4790.2* outlines field-level maintenance as operators and mechanics. The logistics community needs to reshape its processes and make them amenable to prevent mechanics and operators from being a “one trick pony.” The challenge motor transport officers face today are how to employ field-level maintenance personnel properly. One solution is the case study below that tested this theory and produced remarkable results. The future solution is to integrate mechanics and operators into one MOS, enabling them to operate and maintain their equipment up to a field level of maintenance.

### Case Study

The 3d MLG warfighting concept makes it evident that the motor transport fleet and personnel have to be available at a moment’s notice. Maintenance readiness drives operations, and with current resources and processes, this generates problems for the force.

warfighting doctrine in the employment of motor transport operators.

The Commanding General of 3d MLG authorized a proof of principle called Kaizen Maintenance to get after CBM, test the concept of proactive maintenance processes, and encourage NCOs to be creative and take the initiative to correct the deficiencies. The name Kaizen maintenance was created by Col Travis T. Gaines, Combat Logistics Regiment III Commanding Officer. Col Gaines implemented an aggressive 90 days at a time goal to accomplish fiscal year mission-oriented objectives. This requirement did not call for an increase in funding, tables of organization and equipment change request or formalized training for maintenance, supply, and Marine Corps integrated maintenance management system Marines on the new CBM procedures. Modifications were required to the maintenance policy for maintainers and operators to perform data entry in automated information systems, and task organize each maintenance shop into a complete team with an 0411 and 3051. Subject matter experts across 3d MLG conducted operational planning teams and empowered the NCO to not be reliant on legacy concepts and processes. The result was increased safety standards that are captured in a playbook, allowing this to be transferable throughout other units in the force.

Marine NCOs have validated that



Figure 1. (Figure provided by author.)

BGen Keith D. Reventlow, 3d MLG, Commanding General, recently took action to correct this problem BGen Reventlow is a prior MOS (3502), Motor Transport Officer. The elimination of MOS (3502) has caused unforeseen risks in safety, dependency on legacy processes, increased E2M, and outdated

they will uphold or surpass the standard to do things right and execute the mission when given the opportunity to be creative have validated that they will uphold or surpass the standard to do things right and execute the mission. The NCOs did not let legacy processes and standards get in the way of

being proactive and taking care of their military equipment. The unit chosen to execute Kaizen Maintenance was Combat Logistics Battalion-IV. Their readiness increased from 52 percent to a record high of 91 percent in five months. The operators were reinforced with a maintenance chief and four NCOs to provide the culture shift, train operators on zonal preventive maintenance checks and services (PMCS), and how to order and install parts on their vehicle. Learning is continuous, so the Kaizen Maintenance took on “teach, coach, mentor” as the philosophy, and as time progressed during Kaizen Maintenance, the level of confidence and proficiency in the operators to maintain their own equipment increased exponentially. Vehicles that were in maintenance for fan belt replacements, headlights, and PMCS were sent back to the operations section. The new criteria for operators became to work on any vehicle that could start, stop, maneuver, and perform mission functions under its own power. For the first, Marines were taking care of their vehicle as if they were in combat. If the operator’s vehicle was required to stay in maintenance, the operator would remain in maintenance and be involved in the process to ensure his vehicle was brought back to a combat operational status. Maximum usage of the Combat Readiness Storage Program and administrative deadline were used to ensure all personnel had a field mindset of maintaining their gear as resources were scarce. Prior to the 3d MLG Kaizen Maintenance, 95 percent of all preventive and corrective maintenance was performed by the mechanic/technician. This creates an imbalanced E2M, where it was unsustainable and high risk to assume that one mechanic/technician would be able to maintain an average of 35 pieces of equipment. The operator’s only requirement was to conduct important but non-essential repairs, like adjusting a canvass on a vehicle, installing a license plate, or ensuring the SL-3 is available. The mechanic/technician performed essential repairs (e.g. headlights, windshield wipers, normal modifications, and annual PMCS) and critical repairs (e.g. engine, alternator, and transmission

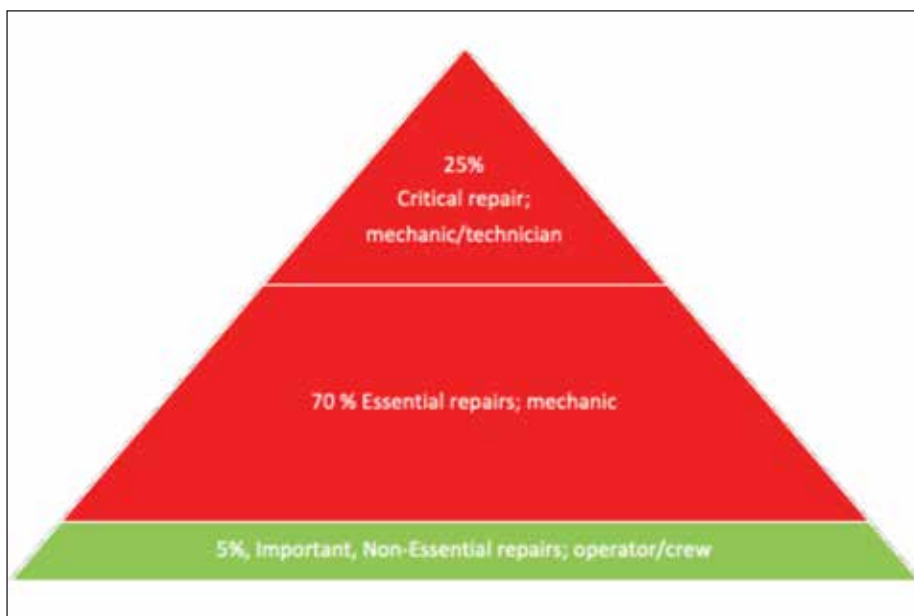


Figure 2. (Figure provided by author.)

replacements/repairs). This old legacy process encouraged operators to have a “rental car” philosophy.

Prior to 3dMLG Kaizen Maintenance, operators turned to maintainers to conduct all repairs and order parts, which increased the maintenance burden and E2M. There was no accountability on the responsible officer or operator to maintain equipment.

Results when operators utilized Kaizen Maintenance. Vehicles are turned into maintenance as the last resort, only when it can no longer start, maneuver,

leaks, or fails to perform mission functions under its own power.

The care and quality of work produced by Kaizen Maintenance is something that cannot be fully appreciated or quantified by the reduction in maintenance cycle time by 37 days and increased readiness posture alone. 3d MLG’s Kaizen Maintenance playbook is a digestible version of our current publication that answers how CBM needs to be implemented across the force and ultimately warrants a revision to *MCWP 4-11.4 Maintenance Op-*

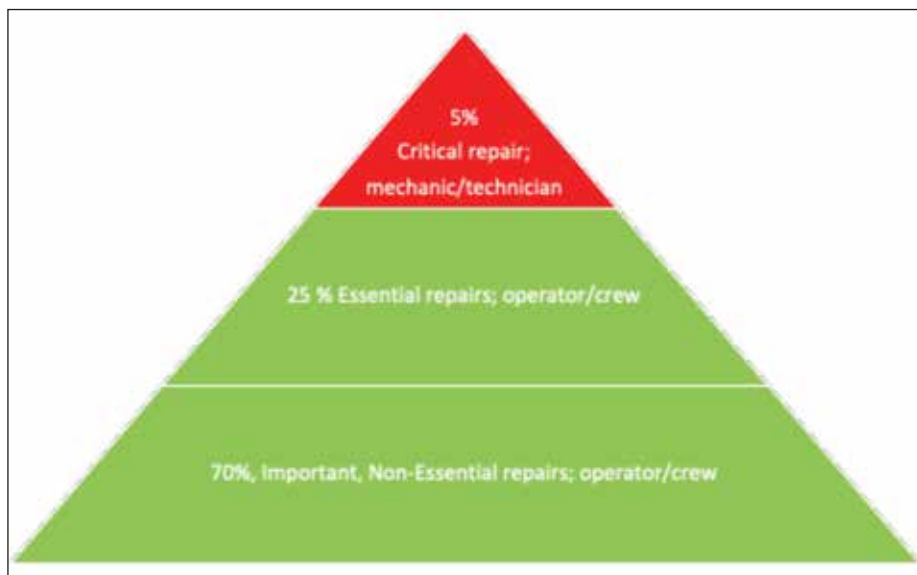


Figure 3. (Figure provided by author.)

erations. 3d MLG commanding general has proven that the concept of CBM works effectively within the 3d MLG CBM Playbook. *Marine Corps Order 4151's*—condition-based maintenance plus (CBM+)—end state is to “increase military equipment operational availability, align enterprise integration goals and objectives, and increase readiness of MAGTF resources available to support FMF commanders.” In order to meet this intent, CBM is what maintenance operations has to look like. The tactics, techniques, and procedures have changed, and maintenance processes have evolved into training the operator to maintaining their own weapon system. This concept has decreased the risk a commander has to assume and increased the likelihood that the field-level maintenance Marine will be able to implement “Message to Garcia.” The plus portion of CBM+ is the techno-

logical enhances, and in this Kaizen Maintenance process, the sensors that facilitated the prediction for proactive maintenance was the Marines. The Marine NCO was the sensor, vice technology, which can be susceptible to failure or malfunction. However, that Marine as the first line of defense, who knows his vehicle intimately, could detect an unusual sound and ascertain that a more in-depth analysis was required to ensure it is combat ready.

### **Why This Matters?**

This article is designed to embolden those not in the motor transport community to embrace this innovation and foster ideas such as the intelligence Kaizen Maintenance. It encourages the force to follow the CMC White Letter 2-20 to embrace CBM+ and take the necessary steps to prepare for the future fight. The point is to encourage

our leadership to increase readiness but also encourage subordinate leaders to find ways to improve legacy processes to help the force sustain lethality. This is for the future lieutenant that will be a general officer one day and is now encouraged to use creativity and not be hindered by legacy ideals. This is what is needed to increase the lifeblood of our institution and better posture us with our doctrine because it forces us to adapt to new circumstances.

