

The Impact of FCS Technologies on Small Unit Performance

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What capabilities will small units require to fight and win our nation's wars in the next 10-20 years? What capabilities should they expect that don't exist today? Recent experience in Iraq and Afghanistan indicates that improvements can be made in four major areas to enhance the combat effectiveness of small units. These are *lethality*, *survivability*, *situational awareness*, and *battle command*.¹ Each one plays a significant part in maintaining the US Army at the cutting edge of modernization and technological innovation. The program responsible for this innovation is the Future Combat Systems (FCS). Its goal is to take a holistic approach in designing and producing a family of modern systems that will enhance the nations' precious land power assets and resources. In short, to make Army small units better to more effectively and efficiently accomplish their mission.

Lethality: To effectively and precisely destroy or to close with the enemy by fire and maneuver and fire and movement are vital to a land power. FCS focuses new technologies on enhancing the ability of small units to deliver precise fires on moving and stationary targets; better laser designation for targeting; and the ability to detect, track, designate, and engage enemy targets. Among the new components are: a new lightweight armored gun system that will have the lethality of an Abrams tank, but in a smaller and more deployable package. A new non-line of sight artillery cannon will deliver firepower faster and more accurately than ever before in all weather and terrain conditions. A new breech loaded mortar will use an automatic loader that will deliver rounds at a higher rate of fire and more range. A revolutionary unmanned and easily deployable, long range "rockets in a box" system will deliver precision fires beyond 25 miles against moving or stationary, armored targets and requiring significantly reduced logistics support. Both man-portable and vertical take-off Unmanned Aerial Vehicles (UAV's) will provide greater visibility, surveillance, and target detection of the battlefield and would give small units an edge in situational awareness, precision targeting, and engagement.

Survivability: As important to delivering precise firepower is the ability for small units to survive on the future battlefield. Toward this end FCS adds the following components among those to be developed: modular armor allowing upgrade platforms as armor technologies mature; and an active armor protection system that provides small units additional survivability on a lighter platform against specific threats.

¹ ARCIC briefing, "Capabilities Provided by Key FCS Technologies," Ft. Monroe, VA, 15 Jan 2008.

Situational Awareness: The conceptual framework of the “Quality of Firsts” are qualities intended to address the ability of future small units to operate inside the enemy’s cycle of adaptation and to deny the enemy opportunities to take action to quickly regain the initiative.² To “see first”, Soldiers must see the battle space in all dimensions. More importantly, they must understand what is important to see. Seeing first involves the exploitation and integration of a wide variety of organic and external information capabilities, the conduct of intelligence activities required to develop the situation in sufficient detail to support planning and decision-making. Toward this requirement FCS provides the following: Improved thermal and optical imagery; layering of sensors for better target coverage; more accurate sensing, breaching, clearing of building and tunnels; remote and rapid alerts with images for small units to assist in clearing buildings; remote reconnaissance, detection, and neutralization of booby-traps, landmines, WMD, and other explosive threats; and the ability to monitor greater areas with fewer Soldiers.

Battle Command: Effective communications over longer distances has always been the mainstay of quick reacting and quick responding modern armies. Toward this end, FCS improves Battle Command through the following: The ability to command on the move inside the Joint Network; combat identification to help prevent fratricide; target identification and discrimination to reduce collateral damage; links to more sensors and shooters; and communications relays to extend ranges for operations over more complex terrain.

Although these new systems enhance the lethality and force protection of small units, they can be better visualized using vignettes that more graphically depict their advantages. The following vignette/scenarios serve to illustrate.

Scenario # 1: SSG Wilkes maneuvered his M-5 Series 3 Segway around a pile of bricks blocking his way. The use of the Segway allowed him and his squad to patrol the dusty streets of the small Afghan villages farther and with less strain than patrolling on foot. He could now cover twice as much terrain with little to no effort...and subsequently his squad was always rested and ready to engage the enemy. Suddenly, a shot rang out and the patrol immediately scrambled for cover. PFC Smith, the point man, was hit and was thrown to the ground. He signaled a thumbs-up that he was okay. His multilayered and lightweight polymer body armor had saved his life. The shot came from a multi-floor building across the street. SSG Wilkes signaled his sensor specialist, SGT Barnes, and pointed to the building. SGT Barnes reached into his rucksack and pulled out a small drone-like object and within seconds had it flying and heading toward the building. Through his helmet display he flew the remote controlled UAV through an open window of the building. Since the drone could hover, SGT Barnes was able to slowly fly it from room to room carefully searching for the elusive sniper with the onboard electro optic camera and infrared sensors. The use of this unmanned device would save the patrol time, energy, and lives rather than having to conduct this operation with patrol personnel. While SGT Barnes conducted his “search,” SSG Wilkes had already begun to maneuver fire team bravo across the street and in defilade from the sniper. Shortly, thereafter, SGT Barnes gave his squad leader the signal that the building was empty and apparently the sniper had fled. He cautiously walked to the building covered by fire team alpha and carefully hid an unattended ground sensor inside the

² TRADOC Pamphlet 525-3-2, Tactical Maneuver 2015-2024, version 1.0, 2 October 2006, p.28-31.

building. SSG Wilkes then contacted his patrol base and informed his parent unit of the incident. He had already sent photos of the building back to his headquarters through his camera phone. He switched his camera phone back to video and ensured it was still secured to his lightweight ballistic helmet. Above him, he heard the quiet whirling sound of a much larger unmanned aerial vehicle that his headquarters had decided to fly in support of his mission. This aerial vehicle would provide over watch for the remainder of his movement. Satisfied with developments thus far, he ordered the patrol to continue along the established route, but adjusted the patrol formation to provide better reaction and security.

Scenario # 2: 2LT Hamilton had driven this convoy route back to Kandahar many times. His mechanized platoon routinely pulled convoy security duty and today's appeared to be no different from previous ones. Just a few more miles and the mission would be completed. Overhead, a tactical Unmanned Aerial System (UAS) provided convoy security and over watch out to the front and flanks of the convoy. As the gunner of his Sullivan M8 infantry carrier vehicle slowly swung the turret to the right, 2LT Hamilton thought he saw a plume of smoke emerge from behind a small hillside. He ordered his driver to veer sharply to the right and out of formation to avoid the anti-tank projectile that was making a bee line for his vehicle. The round missed as the gunner fired his coaxial machinegun at the top of the hill where apparently the missile had originated. Next to him in the turret, the Fire Support Officer (FSO) was already on his Bluetooth calling back to have the UAS redirected to the launch location. Directional information was transmitted immediately and the UAS began hovering over the hill... onboard electro optics scanning for targets. Monitoring the radio net and to the rear onboard a non line of sight mortar carrier, SFC Rivera stopped his vehicle and prepared a fire mission to respond to any additional hostile threat. IF the FSO directed him to, he could have 16 rounds of 120mm rounds on target in one minute. The magazine fed breech-loaded mortar gave the unit an unprecedented capability for organic supporting fires upon request by the platoon leader or convoy commander. Apparently, this would not be the case at this time as the surveillance section operating the UAS from the patrol base radioed 2LT Hamilton that the hillside was clear of any hostile threat. Hamilton breathed a sigh of relief and radioed the convoy commander an all clear. His M8 vehicle fell back into formation as the convoy continued the last stretch of its mission.

Scenario # 3: Through his binoculars, CPT Jones saw the cloud of brown dust that rose from the horizon...the only physical indicator signaling the movement of the enemy tank convoy toward his NATO defense position on the Afghan/Iran border. Inside the M1201 Reconnaissance and Surveillance vehicle, MAJ Warren had already received the unattended ground sensor activations an hour prior. He now gazed at his flat screen as the live video feed from the unmanned aerial systems (UAS) flying near the target displayed the tank formation. As this information came in, an onboard targeting computer was already plotting target data that was networked into the fire direction center for the M1203 155 mm battery preparing for its fire mission. The fire mission was coordinated in conjunction with the "swarm" of armed UAS' that were currently preparing to fire a volley of hellfire missiles at the moving enemy tanks. At the pre-designated time all hell broke loose. Within seconds of the hellfire missiles hitting their targets, the M1203's opened their first volley of rounds toward the remaining UAS untargeted enemy tanks. The projectile tracking system showed all rounds were on target. MAJ Warren watched with amazement as his video feed showed the devastation that occurred. When the smoke cleared over the target area,

numerous burning tanks littered the convoy route. Although the M1203's had already automatically reloaded, there would be no need for a second volley of artillery rounds. He leaned back in his seat with a sigh of relief.

Scenario # 4: Ms. Anderson, the anthropologist with Human Terrain Team # 22, pondered over the situation with MAJ Johnson, the Brigade Combat Team (BCT) Red Team Leader. Knowledgeable in Afghan tribal society and skilled in the Pashto language, she and her team members had completed their interviews with the local village chiefs. But she could still not finalize the human mapping study to determine the traditional tribal boundary locations versus the geopolitical ones near the Pakistan border. The maps her team carried were not adequate for conducting interviews and map tracking because the tribal leaders and village chiefs could not relate terrain features to the map representations. As she briefed COL Jacobs, the BCT commander, he turned to his S2, CPT Smith, and requested immediate on file 3D overhead imagery from the collaborative workstation. CPT Smith added that he would request National Geospatial-Intelligence Agency (NGA) boundary studies from the Soviets which had been obtained through cooperation with the Polish unit in theater. A few minutes later, an imagery file came in, overlaid with colored lines and shadow areas. Ms. Anderson reviewed the 3D imagery and shook her head affirmatively. CPT Smith adjusted the imagery on the screen from different heights and angles. He then provided her with various colored glossy prints of the area. Other reports continued to come in from other sources including those from the Central Intelligence Agency and Defense Intelligence Agency. Looking over his shoulder, Ms. Anderson would point to the ones that she felt would be of most use to her and her team. From the S2 work area, SSG McNeil asked CPT Smith if he wanted to take a call from a NGA representative in D.C. who was on the line with additional information. CPT Smith had Ms. Anderson talk directly to the rep and together they further discussed the boundary issue. This was exactly what she needed to consolidate her field reports and the information she wanted to confirm with the village chiefs. The photos would further help the tribal chiefs associate the geographical features with more definition.

To summarize and conclude, throughout history, technology has always played an important part in enhancing the capabilities of small units: whether the advent of breech loading rifles, the telegraph, the machinegun, or GPS. Simply stated, technology has influenced and improved small unit performance to be more lethal, survivable, situation aware, and better able to command. The four scenarios presented aid in visualizing how some new and advanced technologies relate to missions that have been performed by Soldiers and small units through the ages. But, technological enhancements by no means make inferior units better. What they do is make well led, trained, and resourced units more capable, efficient, and better able to accomplish the mission. FCS includes many small unit enhancing technologies that will make the 21st century Army warrior technologically superior to his 20th century counterpart. Advanced technologies allow units to do more with less and to do more with more. The “more” are the innovative advancements that will ensure that the Soldiers and their small units are, and will continue to be the best motivated and resourced professional combatants on the battlefield. Training will provide the start and the pillar of sustained and effective mission completion... technology will provide a more effective and efficient finish.

US Army COL (Ret), Victor M. Rosello served for 30 years as a military intelligence officer and Latin America Foreign Area Officer. Significant duties were MI Battalion Commander/G2, 82d Airborne Division; Brigade Commander, Gordon Regional Security Operations Center (GRSOC); and G2/Deputy Commander for Operations, US Army South (USARSO). Ranger qualified and a Master Parachutist, his combat tours included Operations Just Cause and Desert Storm, El Salvador (2), and Colombia. A graduate of the US Army Command and General Staff College, School of Advanced Military Studies (SAMS), and the US Army War College, he also holds a Master of Arts degree from the University of Chicago. He is currently employed with MPRI as a military writer for the Army Capabilities Integration Center, Fort Monroe, Virginia, and has published professionally for Army, Parameters, Military Review, Military Intelligence, Infantry, and Low Intensity Conflict and Law Enforcement.

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