USSOCOM TCCC CASEVAC Set Program
A Retrospective and Overview

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ABSTRACT

The United States Special Operations Command (USSOCOM) Tactical Combat Casualty Care (TCCC) Casualty Evacuation (CASEVAC) Set Program was initiated in 2006 as a three-step effort. The initial effort was to develop an improved Individual First Aid Kit (IFAK); this was followed by the development of a Medic bag and culminated with the CASEVAC Set. The intent of the Program is both standardizing the medical load out across SOF components and expanding the skill set of Special Operations Forces (SOF) medical practitioners by providing equipment and training outside the normal parameters of many units. Even though the Set is currently being fielded to a variety of units, there are still personnel unaware of the Set and its capabilities. The goal of this article is to increase awareness of the existence of the program and to promote thought/discussion regarding the expansion of the capabilities of the Advanced Tactical Practitioner (ATP) beyond traditional medical skills. This program is best understood by first looking back to where it originated, and then examining where it is at present.

SOF ATP treats an Iraqi SOF Commando in Baghdad (2010).

In the Beginning

The USSOCOM and Program Manager-SOF Survival Support and Equipment Systems (PM-SOF SSES) held an Industry Day in October of 2009 at Natick Soldier Systems Center in Natick, Massachusetts. The focus of the event was to "assist with strategic market analysis of products and technologies that may be applicable to our military operating environments and missions at remote, forward deployed locations on land and ships." This language, taken directly from the original announcement, only hinted at what was to come. They subsequently issued a Statement Of Objectives (SOO) and identified two primary Key Performance Parameters (KPP's): "1. Preserve the Force and facilitate its reconstitution by reducing preventable battlefield deaths and minimizing effects from injuries. 2. **Provide the SOF Medic with the right equipment**, developed from the attached Performance Specification, **at the right time to prevent death and aid in the recovery** of SOF Battlefield trauma casualties." (Emphasis added) Reducing battlefield deaths and minimizing effects of injuries has been the stated goal of all medical programs since the inception of the Tactical Combat Casualty Care (TCCC) program and was not unexpected. It is the second objective that would define the uniqueness of this program. The intent to standardize medical equipment across SOF assets and to expand the base skill set of ATP's by addressing issues such as vehicle and building extrications and high-angle rescue as a medical problem was something relatively new. Envisioned was a full spectrum systems approach to the equipment set in lieu of restricting contents to traditional medical items. The idea that SOF works in austere environments and has to perform autonomous rescue, sometimes to just access the patient or move the patient to a treatment area drove this new approach to the Set. This was to be a medical capability that placed as much emphasis on ropes and angle grinders as it did on tourniquets and IV fluids.

The initial Industry Day was open to any vendor who produced or sold an item that could be potentially contained in the Set as well as being open to any company that was interested in the role of Prime Integrator. The

Prime Integrator title was a designation that would be given to the Awardee. The job of the Prime Integrator was to coordinate the identification and acquisition of all Set contents and to manage all administrative and logistical tasks related to getting the assembled kits into the field. Given the breadth of the envisioned Set capabilities, this was to be no small task. In addition, the Prime Integrator was responsible for providing New Equipment Training (NET) courses to all primary personnel receiving the Set. The Industry Day included group briefings, opportunities to discuss current utilization and applications of equipment with USSOCOM medical and force modernization personnel and one-on-one scheduled meetings with Program Office personnel to discuss issues specific to a company's approach to the Set.

The Industry Day was followed by a final opportunity to query the Program Office in early 2010, and the Request For Proposal (RFP) was issued shortly thereafter. The RFP was "on the street" (the Program Office's terminology) for a 30-day period at the end of which proposals were due. The initial submittals were limited to paper responses laying out Prime Integrators proposed set design theories, contents and capabilities. These initial submittals were then reviewed by the Program Office for three primary criteria: (1) best performance of the kit, (2) past performance of similar efforts, and (3) price, representing best reasonable value to the government. The process, up to this point, had admittedly followed standard acquisition procedure. If standard protocols had been followed, the Program Office would have selected an awardee based on the submission responses, and sets would have been built and fielded. Every person reading this has received some piece of equipment at some point in their career that made them wonder if the person who chose it had ever actually done the job that the equipment was purchased to accomplish. Fortunately, USSOCOM has advanced beyond traditional acquisition methodology and the Program now moved into an operational testing and end user evaluation phase.

Operational Testing Phase

Following the paper submittals, the Program Office selected three Prime Integrator candidates in mid-2010. These three candidates were then funded to produce three Product Demonstration Model (PDM) Sets each. These PDM's were shipped to the 10th Special Forces Group (Airborne) compound at Fort Carson, CO, for a round of operational testing in January/February 2011. Each Prime Integrator candidate was scheduled to be on site for a one-week period. On the first two days of the week, the Prime Integrator was allowed to provide instruction to a group of fifteen Test Operators/Evaluators. These fifteen Test Operators were from Air Force Special Operations Command (AFSOC), Marine Corps Special Operations Command (MARSOC), Naval Special Warfare Command (NSW), and United States Army Special Operations Command (USASOC). Each Test Operator was provided with a laptop and the appropriate programs to make daily evaluation notes and to grade the Set's performance. After the two-day training period, the Prime Integrator candidate was restricted from the testing area other than during a specified early morning set-up/replenishment period and an evening breakdown/repair period. During the day, the Test Operators utilized the PDM set in monitored scenarios designed by the Senior Medical Representatives of each component command and executed by the Program Office. This identical procedure was followed during the next two weeks for each of the other Prime Integrator candidates. The three week training period was dominated by sub-zero weather conditions and snow. This testing environment helped detect deficiencies in several pieces of equipment related to cold weather use. At the end of the three week test, the Sets were shipped to a contracted training facility outside of Memphis, TN for a repeat of the three week procedure to be held in March/April of 2011. A group of sixteen different Test Operators was drawn from the same four components as in the prior test. This location, while providing a much more temperate climate, offered its own set of challenges. This testing period focused on utilizing the kits in and around water/mud/sand environments and, again, helped to uncover problems with some items.

Contract Award

Following the two Operational Testing periods, the Program Officers returned to Tampa, FL, and reviewed the observations of the Test Operators in conjunction with

During field testing, the E3 module was used to conduct a point lift of a M109 Paladin (27.5 tons!).

the data they had already collected. A five-year Indefinite Delivery Indefinite Quantity (IDIQ) contract was then awarded to the winning candidate with a potential funding amount of $50 million. The contract awardee was Tribalco, LLC, based in Bethesda, MD. Tribalco, while new to the tactical medicine arena, has had a long and successful history of providing integrated solutions and critical services to the military and federal government agencies in communication and information technology applications. Tribalco, understanding that expertise in SOF operations in general and TCCC systems in particular were essential, brought on board a recently separated 18D from 5th Special Forces Group who had just returned from a deployment in Iraq as their internal Program Manager (PM). Additionally, Tribalco teamed with several retired AFSOC Pararescuemen (PJ's) to support the Set configuration development. It was this internal PM and the PJ's that drove the design and contents of the winning submission based directly on the needs experienced during numerous combat tours and rescue operations. The PM, along with other ATPs, makes up the staff that supports the Set update, NET, and fielding procedures.

The Tribalco Integrated Casualty System (TICS) contains every item necessary to treat and transport multiple casualties from the Point of Injury to Definitive Care.

CASEVAC Set Design

From the outset, the Program Office had directed that the Set be separated into four Performance Categories (Kits) with subset modules. These four performance categories were designated as Extraction (E), Mobility (M), Transportation (T) and Sustainment (S). Of interest was that the performance specifications dictated not only that the systems allow for use across the spectrum of SOF military vehicles, airframes and watercraft, but that it also allow for use in indigenous modes of transportation. This last requirement seems to be a recognition of the sometimes unusual nature of the current conflict. Another required design parameter was that the eventual Set be modular/scalable based upon mission profile. With a modular design, the SOF medic could determine which capabilities might be required for a specific mission and only take those portions of the set onto the field. All items in the Set were to be packaged so that they were man-portable (less than 55 lbs) recognizing that target off-sets and extended foot movements were likely.

Tribalco dubbed their winning submission the Tribalco Integrated Casualty Solution (TICS) and met or exceeded all design parameters of the Program. The goal was to deliver a pre-staged capability that enabled the operator to customize each module or sub-assembly for unique mission requirements. The TICS modules come packaged in roto-molded environmentally secure transit cases. The cases are palletizable by virtue of inter-locking features on the tops and bottoms of each case and are also air droppable.

All components of the TICS come contained in seven (7) cases suitable for palletizing or airdrop operations. The TICS cases meet A series Container Delivery System (CDS) requirements.

Of note is that the Modules' nylon packs are delivered in a camouflage pattern designated by each component, and assembled and packaged in each case in accordance with the "Grab and Go" requirement outlined by the Program Office. In other words, once the Set is transported to the forward area, there is no need for the medic to reconfigure the contents from the cases to prepare them to be taken into the field. When the case is opened, all contents are already packaged into backpack carriers ready to be lifted out and deployed. This also means that the cases can be used for storage of the kit when it is not in the field thus protecting contents from environmental damage.

Extraction Modules

The Extraction category is broken down into modules E-1, E-2, and E-3. E-1 provides for patient packaging via

a PJ Sked device, and accompanying hardware to allow for an immobilized patient to be lifted vertically or horizontally. E-2 provides all required ropes, rigging, and climbing devices to provide fall prevention/protection as well as to perform high-angle rescues.

E-3 is the most unusual module to find in a "medical kit." The contents of E-3 include a collapsible sledge, a collapsible halligan tool, 36 volt reciprocating saw, an angle grinder, plus a manually operated hydraulic cutter/spreader (Jaws of Life). The utility of these manual tools was validated during the Operational Testing when these items were used to remove a door from a salvaged Mine Resistant Ambush Protected (MRAP) armored vehicle in under four minutes.

Given the ubiquity of Improvised Explosive Device attacks and the resultant issues of accessing patients in collapsed buildings or damaged armored vehicles, the time for extraction of patients to become a medical issue has come. After all, if you cannot reach the patient how can you treat them?

Mobility Modules

The Mobility category was broken down into two modules (M-1 and M-2). M-1 provides for patient carry and features the All Platform Evacuation (APE™) litter as well as an absorbent patient litter system (APLS) absorbent patient pad capable of containing up to 4.5 liters of fluid alleviating leakage onto vehicle floors during transport. M-1 also contains a variety of medical supplies to support patient care beyond the initial point of injury.

M-2 supports M-1 and augments patient care with a variety of diverse items. Straps that allow the litter to be secured in any manner of vehicle, airframe or watercraft are included. This module also contains a variety of small items such as a rescue knife and a MPLS Helmet Light intended to enhance the ATP's ability to provide care.

Transportation Modules

The original Performance Work Statement dictated that the Transportation Performance Category provide

Modules E-1 and E-2 provide all necessary equipment for horizontal and vertical patient rigging and lifts along with harnesses and tools for personnel fall protection/prevention.

E-3 contains tools (battery and manual hydraulic, no generator or compressor required) and self-contained air bags to allow operators to access patients trapped in vehicles or structures.

M (Mobility) Modules M-1 and M-2 provides a quad-folding litter and patient care supplies designed around the MARCH protocol.

advanced patient monitoring and care capabilities in self-contained modules. Going back to the original intent of designing a kit that would work in any vehicle, the Transportation modules allow the ATP to convert any platform into an ALS ambulance. This ability is critical given that SOF is often without a dedicated medical vehicle platform. T-1/2, T-3/4, T-5 and T-6 modules make up this performance category.

This category presented the TICS designers with the most complex technical challenge given that they desired to mount the electronics equipment in such a manner that it was instantly accessible and usable while still being protected from the external environment. The operational experiences of the Tribalco Program Manager led him to believe that the devices needed to be mounted with all attachments pre-positioned (i.e. patient breathing circuit already hooked into the ventilator) in lieu of requiring set up at the onset of care. Most of the cases supplied from the device manufacturers were not designed with the austere SOF environment in mind and either did not allow for storage with peripheral attachments in place or were not sufficiently rugged to survive in the battlefield environment. Carbon-fiber hard cases were custom built with several innovative features including the ability to lock the cases together stacked horizontally or vertically and the ability to remove the case doors and secure them to the exterior of the case if desired. The case interior contains all devices with peripheral attachments in place such that the medic only needs to turn on the power to the device in order to initiate care. While the hard cases proved ideal for the majority of vehicle applications, end users also required a wall-mountable soft case for use in rotary wing aircraft. The design team worked with the desired dimensional areas and developed the Mobility Optimized First Aid Kit (MOFAK) case, which allows almost all of the Transportation Kit items to be secured in a suitcase style carrier that can be suspended vertically and opened to reveal all contents. In keeping with the original intent of having the entire kit be man-packable, a flatbed-style backpack carrier is supplied that will allow for foot movement of the Transportation modules when needed.

T (Transportation) Modules T-1 and T-2 provide advanced patient monitoring capability. The module contents can be placed in either the custom carbon-fiber hard cases or in a hanging soft case (MOFAK, on the right) that was specifically requested for aviation platforms.

The T-1/2 Module contains Advanced Cardiac Life Support (ACLS) items and comes standard with the Tempus IC™ patient monitor; however, the case will accept other monitors such as the ProPaq® MD. In addition to the primary monitor, this module contains devices to monitor patient temperature, cardiac output and an automated external defibrillator. ACLS medications are contained in a pouch on the interior of the case door and the entire pouch can be instantly removed when needed.

The T-3/4 Module provides for advanced airway and fluid management. This module contains a Simplified Automated Ventilator (SAVe), Glidescope® Ranger video laryngoscope, pressure infuser, fluid warmer, and a Golden Hour® thermal container to allow for transport of blood products. This module also has a removable pouch on the door interior that contains a variety of endotracheal tubes and intubation supplies. A Saros™ oxygen concentrator allows for administration of therapeutic oxygen to the patient without the dangers associated with pressurized flammable gas on the battlefield. The Saros™ comes with a mounting system that allows it to be affixed to the top or side of the hard cases, secured in the MOFAK or attached directly to the patient litter.

The T-5 soft case contains hypothermia management materials including a Hypothermia Prevention and Management Kit (HPMK) blanket and a Geratherm® powered warming blanket along with a 2590 battery and cables allowing the blanket to be run on battery power or from a variety of AC or DC sources. T-6 contains a variety of straps allowing for universal attachment/securing of the Transportation Module hard cases in any type of vehicle. Also included in T6 is the GD Itronix 2000™ ruggedized, wireless computer, capable of recording and forwarding key casualty vital statistics and personal information to follow-on care providers. When connected to a PR-117 or similar radio, the GD 2000™ is able to transmit all patient information in a secure manner. Again drawing on his operational experience, the PM developed a carrier for the computer that mounts to the medic's body armor and incorporates a flip-down privacy screen to eliminate light signature.

The last category, Sustainment, contains the items that would most traditionally be considered as a standard medical kit. However, the TICS designers sought to leverage their operational experience to improve wherever possible. The Sustainment Category is intended to add bulk supplies and additional capabilities to the overall Set allowing for the care of 2 to 5 patients for up to 24 hours. The S-1 Module is built around a custom pack system that unfolds into a supply sheet form that allows for wall hanging. The individual packs on the sheet have semi-clear windows and are removable so that, for example, the S-1 pack could be laid out at a Mass Casualty (MASCAL) incident and the Individual First Aid Kit (IFAK) pouches removed and utilized for patient care. In addition to the four self-contained IFAK pouches, the S-1 also has pouches for respiratory, wound care, IV fluids, and hypothermia supplies. It should be noted that the TICS comes fully stocked with all supplies and a spreadsheet is provided at delivery that allows for medical expiration dates and contents to be tracked. All items in the TICS have been individually NSN'd for ease of resupply. S-1 also has a Mantis tri-fold evacuation board and a Gamow bag to add additional evacuation and treatment capabilities. Included with S-1 is a Medical Supply Chest which is a roto-molded case that, when the top is removed, can be stood on end, and has five pull out drawers of medical supplies that can be used for resupply or in a clinic type environment. Yet another item added based directly on the deployment experience of the designers is a personally worn Tactical Medic – Inter Communication System (TM-ICS). This communication system was designed specifically for U.S. military caregivers and to be compatible with MICH headsets. The TM-ICS is a portable, body-worn, intercom system with an in-line capability for two users and includes user-controlled volume. In addition to being used between patients and caregivers, it can also be used between caregivers (i.e. at patient hand off to a flight medic) enabling clear communication in noisy environments independent of radio systems. S-2 utilizes the same foldout wall mountable design as the S-1 Module bag, but this module, while also containing IFAK's and other items, places an emphasis on airway management supplies. This module provides supplies for basic mechanical ventilation up through advanced surgical airway procedures.

The final item in the Sustainment Category is the individual medic pack. Rather than going with a Commercial Off The Shelf item, the designers once again relied on their operational experience and consultations with commercial nylon designers to develop an innovative bag different from any of the other submissions. From the harness system that integrates directly with the medic's body armor to the user-configurable internal pouch system, the DA Med Bag has numerous unique features.

NET

As part of the contract deliverable, Tribalco and Roco Rescue (a recognized provider of training to USSOCOM units) provide a one-week New Equipment Training

S (Sustainment) Modules S-1 and S-2 provide bulk supplies needed to treat multiple casualties for 3 to 5 days in addition to items such as a Gamow Bag to treat altitude sickness and a tri-folding backboard.

The four IFAK's in Module S-1 contain the needed contents for Point Of Injury care of a single trauma patient in accordance with TCCC guidelines.

Part of the S-2 module, the DA Med Bag integrates with the soldier's body armor and the interior pockets are completely user configurable based on an ATP's needs.

(NET) program to familiarize personnel with the TICS contents and capabilities. The NET program focuses largely on high-angle rescue, rigging and extrication procedures given that these are new skills to most participants. The course is hosted at Roco's training facility in Baton Rouge, LA.

Set Modifications

It is important to understand that this Set is an on-going program and that modifications to the design and contents are anticipated based on emerging technologies and changes in combat conditions/threats/locations and direct interaction with the Committee for Tactical Combat Casualty Care. Any end user who wishes to submit a modification should forward their suggestion to the senior medical representative in their unit. The suggestion should then be sent to the Program Office where it will be presented at a bi-annual meeting. All four components are represented at these meetings and any modifications are voted on for inclusion into the kit.

Unit Acquisition and Fielding

Units interested in acquiring the TICS Sets, Kits or Modules should contact PM SOF SSES for details. Once a unit's request is approved, the Program Office transmits the order to Tribalco and the Set, Kit, and/or Module is assembled. From there it is shipped to a Government warehouse prior to being shipped to the requesting unit. To date, at the time of delivery, both a representative of the Prime Integrator, and PM-SOF SSES are present and a 100% inspection is performed prior to sign over.

Conclusion

The USSOCOM TCCC CASEVAC Set program has, in a very short time for a government acquisition program, gone from concept to a functional fielded capability. Sets have already been delivered to units in all four components and Sets are operational in theatre. Due largely to the Program Office's efforts in running a robust competitive testing process, USSOCOM units are now provided with the best equipment, training, and technologies available to reduce preventable combat fatalities. Perhaps most exciting of all, the program has helped to widen the USASOC, AFSOC, MARSOC, and NSW ATP's skill set to include rescue, extrication and advanced transportation care capabilities.

Disclosure

The author has worked from the commercial sector on the TCCC CASEVAC Program from its onset, and currently has a consulting relationship with the Prime Integrator. The author receives no direct monetary compensation related to the sales of the Set from the Prime Integrator, from any sub-vendors or from the U.S. Government.

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