

# Support to the Warfighter: Logistical Support to the Global War on Terrorism



**Introduction by GEN Benjamin S. Griffin  
Commanding General  
U.S. Army Materiel Command**

**History Office  
U.S. Army Materiel Command  
Fort Belvoir, VA  
2007**

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**Center photo on previous page.** A contractor employee works under a HMMWV at the HMMWV Service Center in Iraq. U. S. Army photo by LTC Virginia Ezell.

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**History Office  
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## **Preface**

Today, more than 150,000 American men and women are deployed alongside coalition allies in Afghanistan, Iraq, and Kuwait. Logisticians have supplied the Warfighters with everything from bombs and bullets to air conditioned living quarters and hot food. It has not always been pretty, and it has not always happened as quickly as one would prefer, but logisticians have exerted tremendous efforts to provide all-important supplies and maintenance.

GEN Benjamin S. Griffin, Commanding General, U.S. Army Materiel Command encouraged us to write a book on the contributions of Army logisticians to the Global War on Terrorism, saying that such critical activities by logisticians are generally not covered in studies of tactics and operations.

This compendium is an attempt to tell some of the when, what, and where of the logistics story, along with some of the how and why. Students of strategy and tactics may consult the operational histories, and students of National Security strategy and Congressional budgeting may consult studies of competing priorities. The following presents some of the stories of the dedicated professionals who supply and support the Warfighters.

This publication is part of the Logistics Issues Research Monograph series started by the AMC Command Historian in 1994. It was completed with guidance and direction from Dr. Robert G. Darius, AMC Command Historian, and is based largely on submissions from historians in the logistics organizations. Thanks go to historians at the AMC Major Subordinate Commands, as well as the U.S. Army Center of Military History, the U.S. Army Combined Arms Support Command, and the Defense Logistics Agency. Dr. William T. Moye, Senior Historian at AMC, compiled and developed the narrative. Ms. Wilma J. Fields, Headquarters, AMC, edited, proofread, and formatted the publication.

**WILLIAM E. MORTENSEN**  
**Lieutenant General, USA**  
**Chief of Staff**



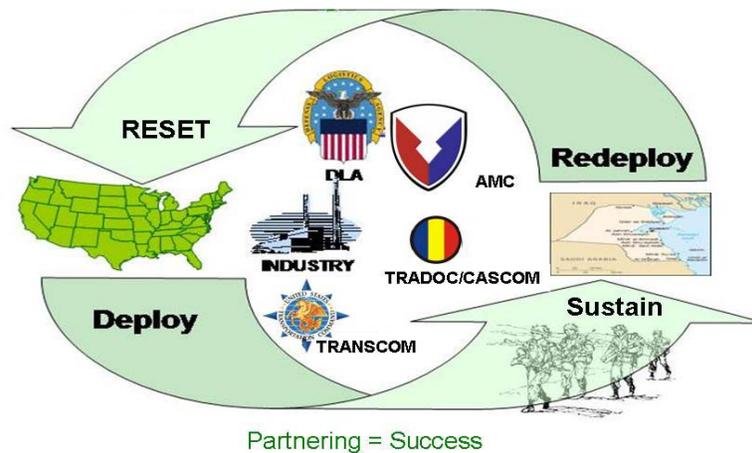
## Primer on Logistics

*To simplify a rather complex organizational structure, DSA handles those items of supply which are common to all three services – clothing, textiles, medical supplies, food, petroleum, and items of this nature, while AMC handles the weapons and equipment needed by the Army to move, shoot, and communicate. In short, DSA operates the grocery market, dry-goods emporium, drug store, and filling station for all of the DoD, while we operate for the Army the hardware store and fireworks concession.*

**GEN Frank S. Besson, Jr. October 18, 1963<sup>1</sup>**

The comment by AMC's first Commanding General still largely holds true. Providing materiel and logistics support to the Warfighter is a complex process that requires the coordination and cooperation of several agencies and activities. The Defense Logistics Agency (DLA), successor to the Defense Supply Agency, provides common items of supply, while AMC provides the guns, spare parts, and maintenance, both working in close partnership with America's private industry. U.S. Transportation Command (TRANSCOM)

### **Partners providing Materiel and Logistics Support to the Warfighter**

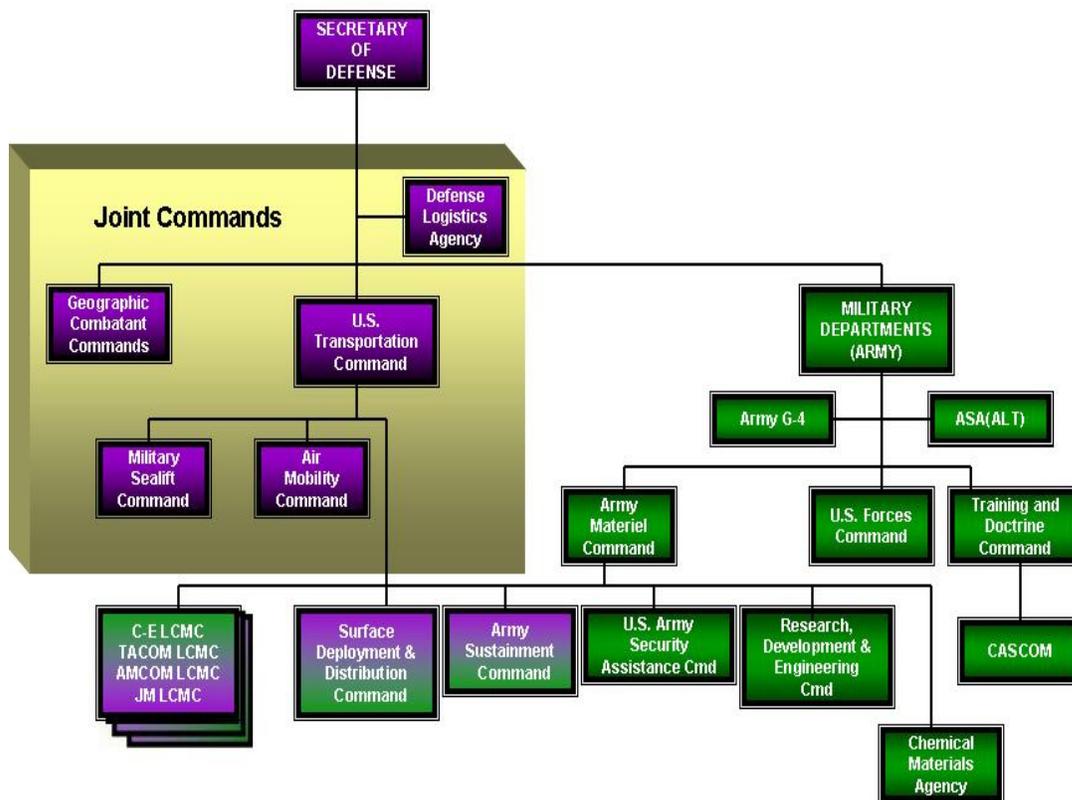


**Graphic provided by AMC G5**

provides the trucks, ships, and planes for the long haul and delivery services. These logistics partners work together to build assets at the national level, to project those capabilities in support of contingencies, and to redeploy, replenish, and reset units on their return home. Expeditionary success requires a joint effort, and working together, the partners provide end-to-end management of the supply chain.

Headquarters, Department of the Army establishes broad policy direction and exercises staff supervision, primarily through the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA(ALT)). The Deputy Chief of Staff for Logistics/G-4 is the national-level logistics staff office responsible to the Chief of Staff, Army for overall coordination of the major logistics disciplines. AMC is the operator, with national-level and global responsibilities to support U.S. forces and our allies. The U.S. Army Training and Doctrine Command (TRADOC) manages the Army’s “schoolhouse,” and the U.S. Army Combined Arms Support Command

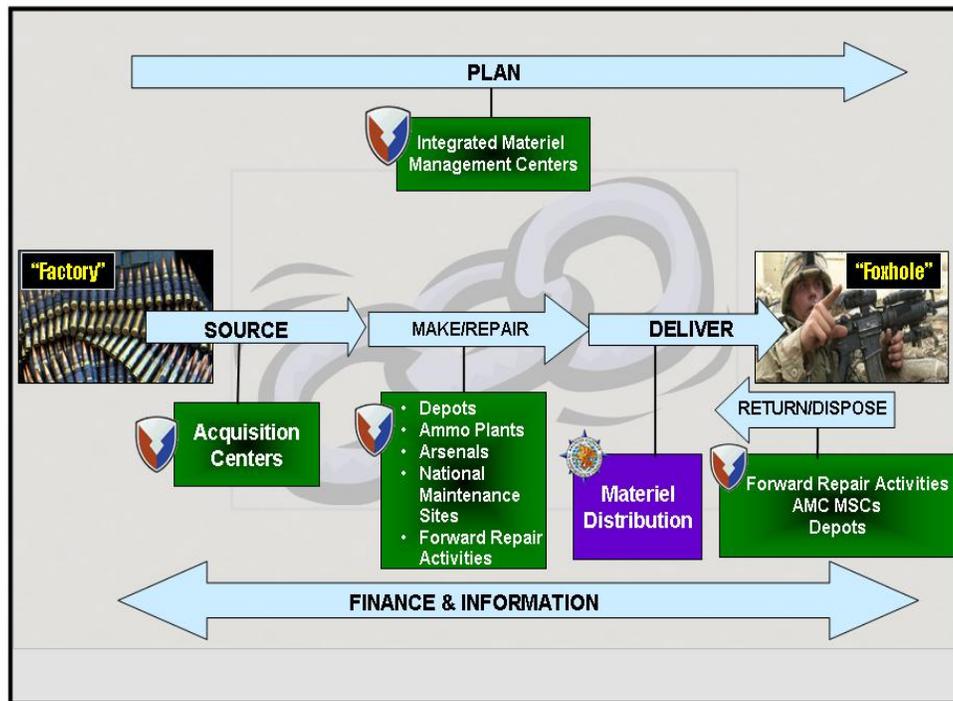
### DoD Logistics Organizations



(CASCOM), a subordinate command, develops and promulgates doctrine in the Combat Service Support (CSS) area.<sup>2</sup>

The Commanding General of AMC (CG, AMC) is the Senior Logistics Commander for the Army, and AMC is becoming the primary provider of logistics and support to both the Army and much of the joint force. Its mission is to acquire materiel, maintain that materiel for the user, and provide guidance for disposal of the materiel. It likes to say: “If a Soldier shoots it, drives it, flies it, wears it, or eats it, AMC provides it.” That is, the Command may have developed and fielded the night vision device, overhauled the tank engine, repaired the radar set, supplied the spare parts for the helicopter, produced the bombs and the bullets, or destroyed the nerve agent.

### AMC's Involvement in the Army Supply Chain



To provide the materiel for the Soldier and to support that Warfighter, AMC – through its Major Subordinate Commands (MSCs) – operates laboratories, arsenals, maintenance depots, and ammunition plants. AMC’s Integrated Materiel Management Centers and Acquisition Centers plan and

## *Primer*

source materiel needed by the Warfighter, while its depots, arsenals, ammunition plants, and maintenance sites make and repair materiel. It coordinates with TRANSCOM to deliver materiel, to include return and disposal.

AMC also provides numerous acquisition and logistics services to the other components of the Department of Defense (DoD) and many other government agencies. For example, it manages the Army contract for the Logistics Civil Augmentation Program (LOGCAP) that provides facilities, services, and personnel. AMC also is the Army's principal agent for supplying materiel and services in support of Foreign Military Sales (FMS). In addition, the CG, AMC has the specific responsibility to ensure establishment of an integrated logistics enterprise, that is, an integrated digital environment stretching from the factory to the foxhole.

In seeking to provide end-to-end distribution and sustainment support for the Warfighter, AMC works closely with national and strategic joint partners, especially DoD-level agencies such as DLA and TRANSCOM. This integration and coordination improves the flow of personnel and equipment all along the cycle of deploy, sustain, redeploy, and reset.

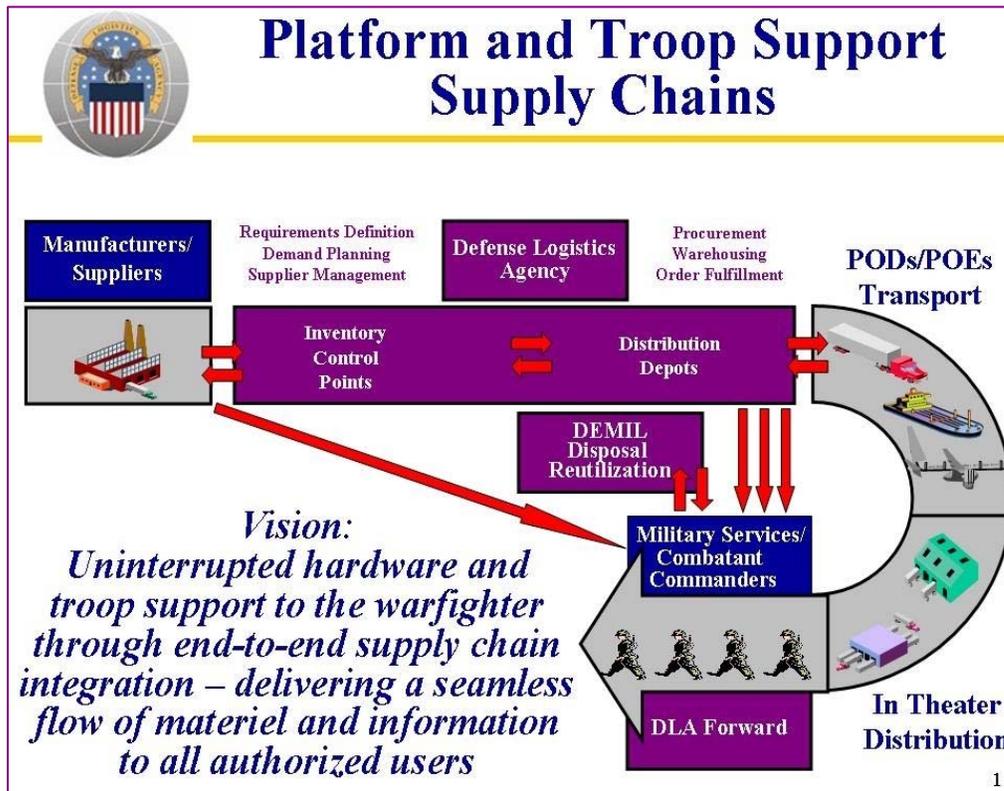
The Secretary of Defense has designated the Commander, TRANSCOM (a joint combatant command) as the overall supply distribution process owner from factory to foxhole. The Military Surface Deployment and Distribution Command (SDDC, an AMC MSC as of October 2006<sup>3</sup>) is the Army Service Component Command to TRANSCOM. SDDC, along with the Air Force's Air Mobility Command and the Navy's Military Sealift Command, provides TRANSCOM with air, sea and surface capability to move DoD assets worldwide.

Known to many as the "warehouse," DLA performs worldwide logistics operations for peacetime and wartime operations, as well as emergency preparedness and humanitarian missions. It is the DoD's primary source for consumable items, whether for combat readiness, emergency preparedness, or day-to-day operations, supplying almost every consumable item America's military services need, from meals to jet fuel.<sup>4</sup>

## Classes of Supply

CLASSES	SYMBOLS	
Class I - Subsistence		
Class II - Clothing, Individual Equipment, Tools, Admin. Supplies		
Class III - Petroleum, Oils, Lubricants		
Class IV - Construction Materials		
Class V - Ammunition		
Class VI - Personal Demand Items		
Class VII - Major End Items: Racks, Pylons, Tracked Vehicles, Etc.		
Class VIII - Medical Materials		
Class IX - Repair Parts		
Class X - Material For Nonmilitary Programs		

DLA's network of lead centers purchase and manage a variety of supplies – Defense Energy Support Center; Defense Supply Center, Columbus, OH; Defense Supply Center, Richmond, VA; and Defense Supply Center, Philadelphia, PA. The Defense Distribution Center, New Cumberland, PA, operates a network of 26 distribution centers around the world that receive, store, and issue supplies. DLA also maintains headquarters in both Europe and the Pacific to support the Combatant Commanders and their service component commands. The DLA Central Command serves as the focal point in Southwest Asia and oversees Contingency Support Teams, with customer support representatives working to bridge communications between DLA and the Warfighter.



Graphic provided by DLA.

National-level logistics concerns include assuring availability of strategic materials and fuels, supporting a military industrial base, developing and procuring new material systems, maintaining and improving critical infrastructure, and rebuilding and improving old materiel systems. National-

level functions are generally performed in the Continental U.S. and are intended to support and sustain activities both in the homeland and abroad.<sup>5</sup>

Theater logistics is the process of planning for and providing goods and services to support military forces operating in specific areas of the world. Theater logistics support focuses on the movement and sustainment of forces operating in joint and combined environments and includes establishing and coordinating the distribution of supplies and services, developing and maintaining sustainment bases, and coordinating the fixing and maintaining of equipment.<sup>6</sup>

For the Army, CASCOM plays a vital role in developing, testing, integrating, and disseminating CSS doctrine and systems. That is, CASCOM develops the leaders, the direction, the guidance, and the materiel solutions. It provides training at seven centers and schools and has recently reorganized to establish a deputy commander for futures and a deputy commander for training. In addition, it sends teams into theater to help Soldiers address critical CSS issues.<sup>7</sup>

In recent months, CASCOM, in coordination with the joint and strategic partners, designed and developed the logistics concept and doctrine of support for the Army service component commander, the Joint Force Commander, or the Regional Combatant Commander. The new concept leverages these partners in both the national sustainment base and the joint operations area, ensuring that support is provided across the full range of military operations in a joint, interagency, or multinational environment. Thus, in 2005-2006, CASCOM facilitated establishment of AMC's new Army Sustainment Command, which will oversee the two-way, end-to-end support and distribution network from the national sustainment base to the deployed expeditionary forces. In addition, CASCOM partnered with SDDC to develop capabilities in port opening and with DLA in forward positioning stocks within the theater.<sup>8</sup>



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## Introduction

The terrorist attacks of September 11, 2001 and the American response generated challenges to the military logistics community both at home and overseas. As the U.S. and its coalition partners launched Operation Enduring Freedom to destroy terrorist training camps and infrastructure and the Taliban military in Afghanistan and as the coalition partners began planning for possible war with Iraq, senior logistics leaders moved quickly to meet the changed environment.

AMC immediately mobilized to assist first responders, to secure valuable assets, and to support Soldiers deployed around the globe. In this new world, AMC re-emphasized its determination to push forward, to put AMC Soldiers, civilians, and contractors on the line with the warfighters. It also redoubled efforts to improve logistics and manufacturing processes in order to provide enhanced equipment in a more timely manner. Overall, the command focused its energy on making the slogan a reality – “get the right supplies to the right place at the right time for the joint force.”

Much of the following focuses on AMC, but there is a larger story and a wider context, as all the logistics partners responded energetically. The collaboration of these joint and strategic partners is crucial to supporting warfighters in the increasingly Joint world, and the contributions of the partnership are told in the chapters ahead.

Members of the logistics community responded from the beginning, providing people, equipment, and supplies to New York City and to the Pentagon and establishing base camps in Uzbekistan to support Coalition forces in Afghanistan. They played a major role in preparing for Operation Iraqi Freedom. In the build-up, for example, the Defense Logistics Agency (DLA) acquired some \$924 million in spare and repair parts, clothing, subsistence, medical supplies, and fuel.<sup>9</sup> AMC’s Logistics Support Element – Southwest Asia (LSE-SWA) managed the download, build-up, and issues of pre-positioned equipment for the 3<sup>rd</sup> Infantry Division (ID) Mechanized (M) and its push on Baghdad. Then they followed Coalition forces into Iraq. The advance party for the 3<sup>rd</sup> COSCOM had reached Balad, Iraq, awaiting action by the 4<sup>th</sup> ID to clear the base.

In supporting operations in Afghanistan and Iraq, logisticians faced a number of issues. Operational commanders executed a plan which put

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logistics and sustainment at risk in order to achieve surprise and speed in the “running start.”<sup>10</sup> DoD curtailed or delayed the arrival in theater of support elements in an effort to “shrink” the logistics footprint. Then, too, plans changed, and inadequate communications, combined with rapidly moving units, meant that support units spent a lot of time locating and chasing the moving targets. This applied to ammunition re-supply after units crossed the berm, but to other systems as well. Moreover, as lines extended into and within Iraq, the supply lines themselves became increasingly vulnerable, requiring establishment of armed convoys and development of a new distribution plan for elements in Iraq that depended more on aviation assets.

Logistics Assistance Representatives (LARs) deployed with their units. During the summer of 2003, these logisticians found ways to deal with significant shortages in tank track, Bradley track shoes, and aviation parts by improving distribution in theater and ramping up production back home. During the spring and summer of 2004, with the rise of insurgent attacks, logisticians found ways to continue support while dealing with the increased threats to the long supply lines from Kuwait into Iraq. Meanwhile, the U.S. Army Combined Arms Support Command (CASCOM) sent teams into theater to assist Soldiers in addressing problems; for example, sending Automated Logistics Assistance Teams (ALATs) to help Soldiers order and track parts requisitions.

On average, there are 90 to 100 DLA employees deployed to Iraq, Kuwait, and Afghanistan. To support Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), DLA has supplied the fighting forces with more than 110 million meals-ready-to-eat (MREs). The Agency has also been supplying field rations that require no kitchen or only a rudimentary kitchen to prepare, providing some 127 million unitized group ration meals. At the same time, in support of OEF, it has shipped humanitarian support, including 3.5 million pounds of wheat, 49,000 pounds of dates, 3.8 million humanitarian daily rations, and 30,000 blankets. Significantly, the Agency has carried out its mission with about 21,000 employees, about one-third the number employed in 1992.<sup>11</sup>

The U.S. Army Security Assistance Command (USASAC), an AMC Major Subordinate Command (MSC) and “the Army’s face to the world,” helps our friends and allies to work more effectively alongside American Soldiers. In recent years, it has helped provide equipment, materials, and training through Foreign Military Sales (FMS) and other services to Coalition

partners and other allies, a total of about 150 countries and multinational organizations in all parts of the world.

Even while focusing on support to the forces in Southwest Asia, logistics leaders pushed initiatives to improve processes, especially to meet the goals set by GEN Eric K. Shinseki, Chief of Staff, Army, "Our goal is to be able to deploy a combat-capable brigade anywhere in the world within 96 hours after the receipt of an order to execute liftoff, a division within 120 hours, and five divisions within 30 days."<sup>12</sup>

AMC implemented a number of organizational changes and achieved several milestones in moving towards networking logisticians and warfighters via digital capabilities. The entire Army was converted and capitalized under Single Stock Fund by May 2003, the Logistics Modernization Program (LMP) went "live" in July 2003, and AMC continued its push to "deliver seamless logistics business processes and seamless automation from factory to foxhole."

Significantly, DLA pursued much the same goal, using the same vendor for a major part of the Business Systems Modernization (BSM) program. As defined by the Agency, benefits to the Warfighter include improved materiel availability, reduced customer wait time, reduced cost, and improved data integrity.

At the same time, AMC sought funding and pursued innovative partnerships to rejuvenate its industrial base of arsenals, maintenance depots, and ammunition plants. Moreover, it implemented programs intended to improve productivity and managerial efficiencies in the industrial operations, using the Lean and Sigma Methodology to evaluate and improve processes. The Command claims a number of successes, including improved processes for rebuilding helicopter engines and for recapitalizing High Mobility Purpose Wheeled Vehicles (HMMWVs). The improvements save time and produce better equipment and also save money. Overall, AMC claims savings in excess of \$200 million in 2006 generated by applying Lean Six Sigma.<sup>13</sup>

We are realigning our organizational structure to focus the combined capabilities of the acquisition, logistics, and technology communities to provide a "one-stop" for deployed units and "cradle-to-the-grave" support for equipment and systems. In addition, we have reorganized Surface

## *Introduction*

Deployment and Distribution Command (SDDC) as a Major Subordinate Command (MSC) of AMC to improve distribution functions.

Most importantly, in addressing issues associated with the Base Realignment and Closure Commission (BRAC), the Army's new modular structure, and Reset, the logistics community continues its efforts to improve processes and to provide equipment when and where needed. Our new concept of support to the Joint Force Commander or the Regional Combatant Commander leverages the capabilities of the joint and strategic partners in both the national sustainment base and the joint operations area to ensure we provide support across the full spectrum of military operations.

We are fighting a long war against a global enemy. Together, we are moving ahead, focusing on the Joint Warfighter today while transforming for tomorrow.

**GEN Benjamin S. Griffin**  
**Commanding General**  
**U.S. Army Materiel Command**

# Chapter I

## Support to the Warfighter

### Terrorist Attacks

In the days immediately following the attacks of September 11, 2001, AMC personnel assisted first responders at the World Trade Center. For example, a team of Soldiers from the U.S. Army Armaments Research, Development, and Engineering Center's (ARDEC) Explosive Ordnance Disposal Technology Division guided robots into the smoking rubble in search of survivors. They worked their way down to the third and fourth levels of the six-level basement area, uncovering three bodies but finding no survivors.<sup>14</sup>

The U.S. Army Communications-Electronics Command (CECOM) provided assistance in several ways. In an effort to locate people in the rubble, CECOM worked with its contractors to use a developmental device that could triangulate a cell phone. It also provided tiny infrared cameras that



**Emergency workers insert PVC pipe with tiny CECOM camera attached to search in the rubble. U.S. Army photo.**

## *Chapter 1*

could be attached to PCP pipe and snaked into the debris to look 360 degrees around in the rubble. The technologies offered to rescuers by CECOM proved so useful that the Federal Emergency Management Agency (FEMA) clamored for additional engineering support and ultimately established a field office at Fort Monmouth, NJ, based largely on the installation's proximity to New York City, communications resources available on post, and the opportunity for collaborative and cooperative ventures.<sup>15</sup>

In Washington, CECOM deployed a quick reaction task force to the Pentagon to install a communications infrastructure for 4,500 displaced workers. Then CECOM teamed with the Pentagon renovation office to provide engineering and integration support to renovate the command and control infrastructure in support of the rebuilding effort.<sup>16</sup>

AMC had already begun shipping ammunition. Within 11 hours of the attacks, U.S. Army Operations Support Command (OSC) shipped ordnance to the U.S. Air Force. Two days after the attacks, MG Wade H. McManus, Jr., Commander, OSC, flew to Washington to brief the Chief of Staff, Army (CSA) on the readiness of the ammunition stockpile. COL Redding C. Hobby, then Chief of Staff, OSC, later commented: "The terrorist attacks showed us that there was no thinking, no planning. We've got to be ready on a moment's notice with Air Force bombs and Marine small arms ammunition as well as Army ammunition."<sup>17</sup>

Headquarters, AMC made office space available to Department of the Army (DA) Deputy Chief of Staff for Logistics (DCSLOG)/G-4 employees displaced by the attacks on the Pentagon. Headquarters also implemented a 24/7 Operations Center, calling in Reservists to help conduct operations.

## **Homeland Defense**

**Anthrax Attacks.** One week after the plane hijackings, a set of letters containing anthrax bacteria were mailed to several news media offices. Around October 9, two more letters were mailed, one to Senator Tom Daschle of South Dakota and one to Senator Patrick Leahy of Vermont. Five people died from inhalation anthrax, and 17 others were sickened. In October, the Technical Escort Unit (TEU) from the Soldier and Biological Chemical Command (SBCCOM) responded to Washington during the anthrax episodes

and conducted operations at Senate office buildings, the White House complex, and the Pentagon.<sup>18</sup>

**Installation Security.** Meanwhile, AMC moved to protect and secure its special installations. On September 11, 2001, AMC had more than 31,000 tons of chemical weapons: nerve and mustard agents in bombs, rockets, mines, and containers sitting in eight different storage locations. Some of these munitions dated back to World War II, and some of the chemical stockpile sat in outside storage. In addition, there were organic industrial sites and facilities conducting classified research that provided tempting targets for terrorists. All had to be secured quickly.<sup>19</sup>

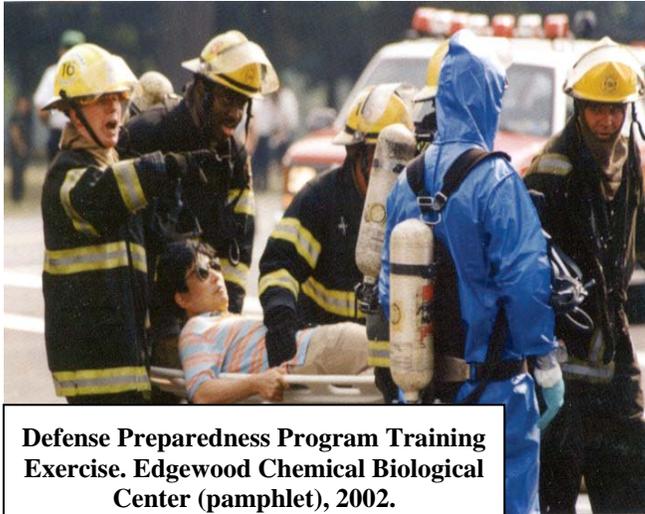
For the first time, AMC called on National Guard troops to guard chemical weapons sites. More than 21,000 Army National Guard and Army Reserve Soldiers were mobilized and deployed to 34 different locations in the continental United States. For example, some 100 Soldiers from the California Army National Guard 40<sup>th</sup> Infantry Division (Mechanized) were federalized after the attacks and sent to guard the Tooele Army Depot in Utah.<sup>20</sup>

Company A, 268<sup>th</sup> Military Police Company of the Tennessee National Guard, based in Ripley, TN, helped to secure the Milan Army Ammunition Plant (AAP) along side the existing Ordnance Ground Force. They also augmented security at Holston AAP. Since being deployed, the Soldiers proudly refer to themselves as Team Milan.<sup>21</sup>



**3/268<sup>th</sup> Military Police Company based in Ripley, TN, assigned to Holston AAP November 2001 — August 2002, U.S. Army Photo.**





**Defense Preparedness Program Training Exercise. Edgewood Chemical Biological Center (pamphlet), 2002.**

Headquarters, AMC worked with the Major Subordinate Commands (MSCs) and quickly identified immediate requirements for force protection and Reserve Component augmentation forces and documented these needs to the Army Budget Office. As a result, AMC received Emergency Response Fund, Defense monies to enhance force protection

at all AMC installations, including chemical sites, ammunition plants, and depots.

Operation Roving Osprey was the program to harden storage facilities at the various chemical stockpile sites around the country that stored bulk chemical agents. This involved moving the agent to temporary sites and then moving it to completed hardened facilities.<sup>22</sup>

**First Responder Training.** Following 9/11, the training for domestic preparedness and installation preparedness became a critical contribution. MG John C. Doesburg, Commander, SBCCOM commented:

*The first people on the scene are going to be police, fire, emergency responders, and they have to be trained in how to respond. A bio [biological] incident or a chem [chemical] incident is not unlike a HAZMAT (hazardous materials) incident that they respond to any given day, any given week. What I've seen is an increased awareness of that need to train first responders, and the increased awareness that we have a lot of expertise to help them.*<sup>23</sup>

Since 1996, Edgewood Chemical Biological Center's (ECBC's) Homeland Defense Business Unit had already trained over 28,000 first responders in more than 100 communities. After 9/11, the demand for their

expertise increased significantly. The team reported helping military, federal, state, and local emergency responders with weapons of mass destruction (WMD) training, planning and technical assistance. Specialized training was also provided by Edgewood elements for those units facing deployment in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF).<sup>24</sup>

**Homeland Security.** U.S. Army aviation and missile assets managed and supported by organizations at Redstone Arsenal were an important element of the evolving homeland security mission. One of the most visible of these combined exercises was Operation Clear Skies, a series of air defense exercises and operations conducted by joint and interagency entities in the aftermath of the terrorist attacks.<sup>25</sup> Held in conjunction with the increased security precautions implemented during the Fourth of July 2002 celebrations, Clear Skies I was conducted in the National Capital Region (NCR) with about 30 participating groups. Clear Skies II was conducted in the fall of 2002, around the anniversary of the terrorist attacks. Clear Skies III followed early in 2003.<sup>26</sup>

Also in 2003, the North American Aerospace Defense Command directed that two Avenger turrets be placed on specialized platforms built for emplacement in the capital region. A lightweight surface-to-air missile/gun system, the Avenger is designed to counter low-flying, high-speed fixed-wing aircraft and helicopters. On January 10, 2004, the Army successfully completed the emplacement of the first rooftop Avenger system, designed and built by the Aviation and Missile Research, Development, and Engineering Center Prototype Integration Facility and the Short Range Air Defense Project Office.<sup>27</sup>

## **Operation Enduring Freedom (OEF)**

**Afghanistan.** OEF commenced on October 7, 2001. Emerging doctrine relied heavily on contributions of special operations forces and joint firepower provided by the Air Force and Navy. Early combat operations included a mix of air strikes from land-based B-1, B-2, and B52 bombers; carrier-based F-14 and F/a-18 fighters; and Tomahawk cruise missiles launched from both U.S. and British ships and submarines. The majority of munitions delivered in the first waves of air attacks had an explosive warhead built at just one place, AMC's McAlester (Oklahoma) Army Ammunition Plant.<sup>28</sup>



**Workers at McAlester Army Ammunition Plant fill a U.S. Navy BLU 500 pound bomb with plastic bonded explosives. U.S. Army photo by Jerri Mabray.**

Army forces involved in the initial stages of OEF included Special Forces “A” Teams that organized, trained, and led indigenous Afghan resistance fighters against the Taliban. As the U.S. launched operations in Afghanistan, AMC deployed elements in support. The initial LSE Forward was established at Karshi-Khanabad, Uzbekistan, on November 18. Within just a few months, AMC had established additional forward positions in Afghanistan and Pakistan. AMC Logistics Assistance Officers (LAOs) and Logistics Assistance Representatives deployed to Southwest Asia (SWA) with their

supported units, in some cases very early in the flow. Their value as a combat multiplier consisted not only of their expertise in supply and maintenance topics, but also in the communications package they deployed with. As GEN Paul J. Kern, Commanding General (CG), AMC<sup>a</sup> later commented, “*We were supplying oats and hay to the Afghan forces while Soldiers were learning to ride again. At the same time, we were guiding in laser-guided bombs for the Air Force.*”<sup>29</sup>

Troops from the 10<sup>th</sup> Mountain Division deployed to Uzbekistan to secure staging bases for logistics, aviation, and quick reaction force movements into Afghanistan. By the end of November 2001, Soldiers from the 101<sup>st</sup> Airborne Division (Air Assault) had deployed to three air bases in Pakistan used by U.S. forces. Logisticians from Fort Bragg’s I Corps Support Command (COSCOM) and the Special Operations Support Command deployed into the primitive forward bases in Uzbekistan and Pakistan as well. They received forces deploying into theater, provided all classes of logistics support to all

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<sup>a</sup> GEN Paul J. Kern served as Commanding General, AMC from October 2001 until October 2004. GEN Kern had previously served as the Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology.

services' personnel, and pushed support forward to the Soldiers operating in Afghanistan.<sup>30</sup>

**MMCS.** In the 1990s, AMC invested in the Multi-Media Communications System (MMCS), a satellite-based communications package that allowed the LAO to communicate via telephone, Non-Secure Internet Protocol, and Video Tele-Conferencing directly back to the Continental U.S. (CONUS). Units soon discovered that their supporting LAOs and LARs had these reliable communications links, making the LSEs a key communications node for supported forces.



**CECOM Mobile Portable Operations Center with MMCS. U.S. Army Photo (C-E LCMC).**

The Logistics Civil Augmentation Program (LOGCAP)<sup>a</sup> provided the flexibility to contract for support operations in Afghanistan, and in October 2001, the Army began to deploy Force Provider (FP) “city in a box” modules support of OEF. These FP modules are a combination of military and

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<sup>a</sup> The Logistics Civil Augmentation Program (LOGCAP) is an Army initiative for peacetime planning for the use of civilian contractors in wartime and other contingencies. These contractors will perform selected services to support U.S. forces in support of Department of Defense (DoD) missions. Use of contractors in a theater of operations allows the release of military units for other missions. This program provides the Army with additional means to adequately support the current and programmed forces. LOGCAP dates from 1985 and is described in Army Regulation 700-137. In 1997, management of LOGCAP was assigned to AMC.

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commercial products that provide climate-controlled billeting, quality food and dining facilities, hygiene services (showers, toilets, and laundry), and morale, welfare, and recreational facilities. The modules come complete with water and fuel storage, power generation and distribution, and wastewater collection systems. The deployment to Central Asia provided an early entry capability that directly supported air and ground combat operations inside Afghanistan.<sup>31</sup>

**LOGCAP.** Since 9/11, LOGCAP has provided support with other 54,000 contractors with a contract value of \$23 Billion (Rough Order of Magnitude) in CONUS and 11 foreign countries with most support being under harsh and hostile conditions. This LOGCAP support is unprecedented, if not unique, in recent times. In addition to the extensive U.S. military support, LOGCAP has supported the Polish Multinational Division, North Atlantic Treaty Organization, and a diverse range of U.S. Government civilian agencies such as the Iraqi Survey Group, Coalition Provisional Authority, Threat Analysis Agency, and the U.S. Embassy Iraq, Department of State. The LOGCAP also developed the Iraqi Oil Field Reconstruction Plan in October 2002, which was executed and is operated by a separate Kellogg, Brown, and Root (KBR) LOGCAP type effort now in Iraq.

DA gave AMC eight weeks to ship and set up the first base camp, but AMC accomplished the task in about six weeks. Active duty Soldiers and reservists in Europe and the U.S. moved containers from storage sites in Luxembourg and the U.S., including Albany, GA, and Sierra Army Depot, CA. Many containers were shipped to a staging area near Ramstein Air Base in Germany, where Soldiers from the 21<sup>st</sup> Theater Support Command (TSC) and AMC's Combat Equipment Battalion (CEB)-Luxembourg palletized the containers for military airlift. More than 100 containers were loaded onto Air Force C5s and contracted 747s.<sup>32</sup>

These FP modules were assembled at the base camp in November. Civilian technical specialists from the U.S. Army Soldier Systems Center (SSC)-Natick were the first boots on the ground to orchestrate the construction of Camp Stronghold Freedom, Uzbekistan. They surveyed the site, designed the layout, organized site preparations, supervised shipment and receipt of containers, and oversaw setup of the camp. Once AMC's job was completed, Soldiers from the 542<sup>nd</sup> Quartermaster Company (Force Provider)

from Erie, PA, and the 507<sup>th</sup> Corps Support Group from Fort Bragg, NC, took over operations at the new camp in early December.<sup>33</sup>

Initially, FP modules were employed at two sites. In Uzbekistan, they were operated entirely by the Army and provided support to Special Operations Command (SOCOM), Army, and coalition forces. The Camp Stronghold Freedom base camp supported an average of about 3,500 Soldiers on a daily basis. In Kyrgyzstan, Air Force personnel set up and operated the base camp for airfield operations. Then, in June 2002, modules were deployed and set up near Kandahar, Afghanistan, to house Soldiers engaged in combat operations.<sup>34</sup>

**Philippines.** While continuing the build up in Southwest Asia, the U.S. provided additional support to the government of the Philippines during Exercise Balikatan 02-1, a counter-terrorism training effort in the southern Philippines. In January 2002, more than 1,200 members of Special Operations Command, Pacific (SOPAC) and its components joined their counterparts from the Southern Command of the Armed Forces of the Philippines in an aimed offensive at the Abu Sayyaf guerrillas, who have been linked to the al-Qaida terrorist group. The exercises were conducted in Zamboanga and Basilan Island, which are roughly 1000 km south of Manila. AMC's role in supporting this portion of the campaign on terrorism was to provide support under LOGCAP.<sup>35</sup>

## **Operation Iraqi Freedom**

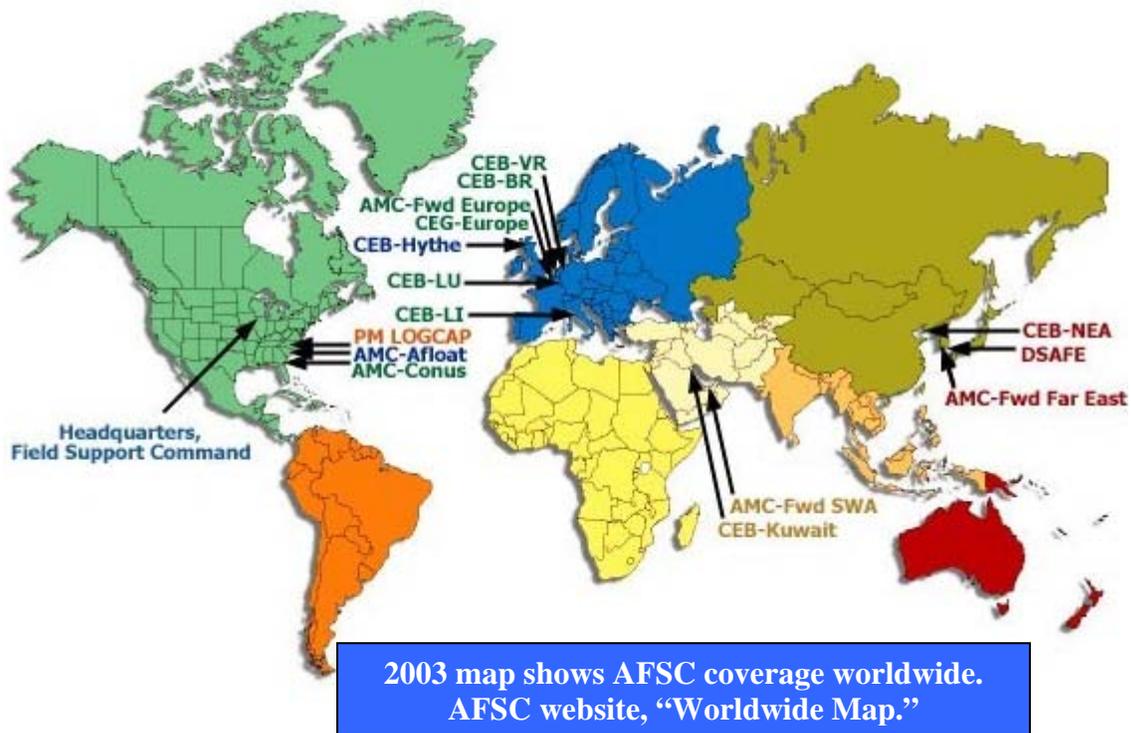
### **Army Prepositioned Stocks (APS)**

*The value added was Soldiers were able to fly over—they didn't have to prep their equipment at Fort Stewart to get it over here. They were able to fly over, fall in on the combat systems, begin training on them right away, and get up and go to work. They didn't have to spend untowards amounts of energy at home station getting ready to get their equipment over here. And they didn't have to spend a lot of energy when they got here trying to get their equipment ready. They came, it was ready, and they were able to go train and fight. That's really the value added.*

**BG Vincent E. Boles, Commanding General (CG), AMC Southwest Asia (SWA)<sup>36</sup>**

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Following the Gulf War, the Joint Chiefs of Staff (JCS), concerned by the long time it took to deliver heavy forces and associated logistical support, concluded that “limitations in mobility forces had imposed considerable risk.”<sup>37</sup> Effective October 1, 1993, DA directed AMC to assume responsibility for the Army War Reserve Program to provide a central management for war reserve stocks, which at that time consisted of four separate stockpiles: AR-1, CONUS; AR-2, U.S. Army, Europe; AR-3, Prepositioned Afloat; and AR-4, Korea. The Depot Systems Command (DESCOM), an AMC MSC, became responsible for maintaining the stockpiles.



In a 1995 organizational realignment within AMC, DESCOM was merged into the Industrial Operations Command, headquartered at Rock Island Arsenal, IL. During the late 1990s, AMC implemented several initiatives to strengthen and rationalize its services to Soldiers in the field. In 2003, AMC

stood up the Army Field Support Command (AFSC) as an MSC to manage the Army's Global Prepositioning Strategy in support of deploying forces.<sup>a 38</sup>

AMC's other various MSCs managed the procurement and distribution of APS equipment and secondary items of supply, while AFSC managed the storage and handoff of stocks at the APS sites, which were aligned as follows:

- APS-1, CONUS. Operational projects and sustainment stocks stored in CONUS depots.
- APS-2, Europe. Combat Equipment Group-Europe (CEG-E), headquartered in Eyselshoven, the Netherlands.
- APS-3, Afloat. Combat Equipment Group-Afloat, headquartered at Goose Creek, South Carolina.
- APS-4, Northeast Asia. AMC Forward-Far East, headquartered at Camp Market, Korea.
- APS-5, SWA. AMC Forward-Southwest Asia, headquartered at Doha, Qatar.

### **Establishment of Logistics Support Element – Southwest Asia**

In October and November 2001, following the terrorist events of September, Combat Equipment Group-SWA (CEG-SWA) began limited shipping of equipment to Kuwait, such as the Inland Petroleum Distribution System (IPDS) and a portion of a Brigade Combat Team (BCT). In addition, CEG-E shipped items to Qatar, including rolling stock (i.e., trucks, tanks, etc.).<sup>39</sup>

AMC officially established its LSE-SWA on December 1, 2001 at Camp Doha, Kuwait, to support ongoing operations in Afghanistan, Uzbekistan, and Pakistan. The LSE built on one of the major lessons learned from the Operations Desert Shield/Storm (ODS/S) experience, the need to preposition equipment to support the deployment of heavy forces.

Initially, the LSE-SWA was a small cell of 12 personnel from CONUS that was collocated with the Coalition Forces Land Component Command (CFLCC) C-4. After the State of the Union speech in January 2002, in which

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<sup>a</sup> The Commander of AFSC (now Army Sustainment Command) oversees major parts of three critical programs – APS, Logistics Assistance Program (LAP), and Logistics Civil Augmentation Program.

the President identified the “axis of evil,” the Army sent APS planners into SWA and began to redistribute assets from Europe into theater and from Qatar into Kuwait. In support of the APS buildup, the Army greatly increased funding for repair parts, sustainment stocks, and operational project stocks (OPS); including critical water and petroleum, oil, and lubricants (POL) supply items.<sup>40</sup>



**A fuel specialist with the 267<sup>th</sup> Quartermaster Company checks IPDS pipeline at Camp Udairi, U.S. Army Photo by SPC Peters Liu.**

#### **Quartermaster Petroleum Support.**

Petroleum storage and distribution techniques have steadily improved in recent decades, most notably with the introduction in the 1980s of the inland petroleum distribution system (IPDS). This system is made up of three main components: The tactical petroleum terminal (TPT), which consists of several collapsible fabric storage tanks, with assorted pumps, hoses, and essential hardware; aluminum pipes, each 19 feet long and 6 inches in diameter, packaged together in sets; and a series of high-pressure pump stations capable of forcing fuel from the bags through the pipes to the dispensers. Army doctrine assigns pipeline and pump station construction to the Corps of Engineers, and TPT installation and recovery, as well as operation of the

entire inland petroleum system, to Quartermaster petroleum terminal operating units. To support Operation Iraqi Freedom, the Engineers and Quartermasters constructed more than 160 miles of pipeline extending from Camp Virginia in Kuwait to TPT Cedar II in Iraq. This system delivered more than 80 million gallons of fuel between February and September 2003.

A small "planning cell" made up of Soldiers from the 240<sup>th</sup> Quartermaster Battalion arrived in Kuwait on January 15, 2003. The Kuwaiti government had earlier agreed to provide free fuel to all coalition forces, and the Al Ahmadi refinery used its commercial pipelines to distribute fuel to the Camp Virginia TPT, already constructed by a platoon from the 240<sup>th</sup> during 2002. Members of the 416<sup>th</sup> Engineering Command (a Reserve unit from Darien, IL) mapped and reconnoitered the ground, and determined the best trace for the pipeline. The

62<sup>nd</sup> Engineer Combat Battalion (Heavy), an active duty unit from Fort Hood, TX, began construction in mid-January 2003. They were soon joined by reservists from the 808<sup>th</sup> Engineer Pipeline Company and two National Guard units, the 226<sup>th</sup> Engineer Company from Kansas and Charley Company, 46<sup>th</sup> Engineer Combat Battalion (Heavy) from Paris, TN. These units worked closely with the 49<sup>th</sup> Quartermaster Group's petroleum operating specialists to complete the first leg of the IPDS in roughly three weeks time.

When completed on February 25, the initial IPDS pipeline ran 18 miles from Camp Virginia north to a second TPT at Camp Udairi. The final TPT in Kuwait, named Breach Point West (more commonly called BPW) was built 33 miles northwest of Udairi, just six miles from the Iraqi border. This section of the IPDS pipeline was completed on March 18. Thus, the IPDS pipeline linked the Al Ahmadi refinery on the coast to BPW up on the Iraqi border. No sooner had the first IPDS been completed than a decision was reached to build a second line parallel to the first, running from TPT Virginia to BPW. Begun on March 1, this remarkable undertaking saw 51 miles of IPDS pipeline and pump station assemblage completed in just 17 days.

CFLCC had decided on the very eve of war to extend the IPDS into Iraq as conditions allowed. As soon as the First Marine Expeditionary Force had taken Jalibah Airfield, not far from An Nasariyah in southern Iraq and set up a hospital and supply depot there, Army Engineers moved in and started construction on what became known as TPT Viper. Large collapsible bags were installed and protected in the usual fashion. Meanwhile, Marine Corps petroleum specialists in the course of just five days laid out 60 miles of 4-inch flexible pipeline.

After Tallil Airbase was captured a bit further to the north, Army Engineers and 49<sup>th</sup> Group personnel quickly moved in and built TPT Cedar I, with twenty-four 210,000-gallon collapsible bags. In four weeks (from March 22 to April 20), they laid out 80-plus miles of IPDS pipeline, connecting BPW in the rear to Cedar I very near the fighting front.

The last major Quartermaster petroleum storage and distribution site to be built and made operational while fighting still continued was TPT Cedar II, located 34 miles northwest of Cedar I. This final leg of the IPDS system was begun on April 27 and was finished on June 6. Its construction was made possible only because by then commercial pipelines extended from the coastal refineries all the way to BPW on the Kuwaiti border. This in turn freed up all the IPDS pipelines and pump stations in Kuwait for use deep in Iraq.<sup>a</sup>

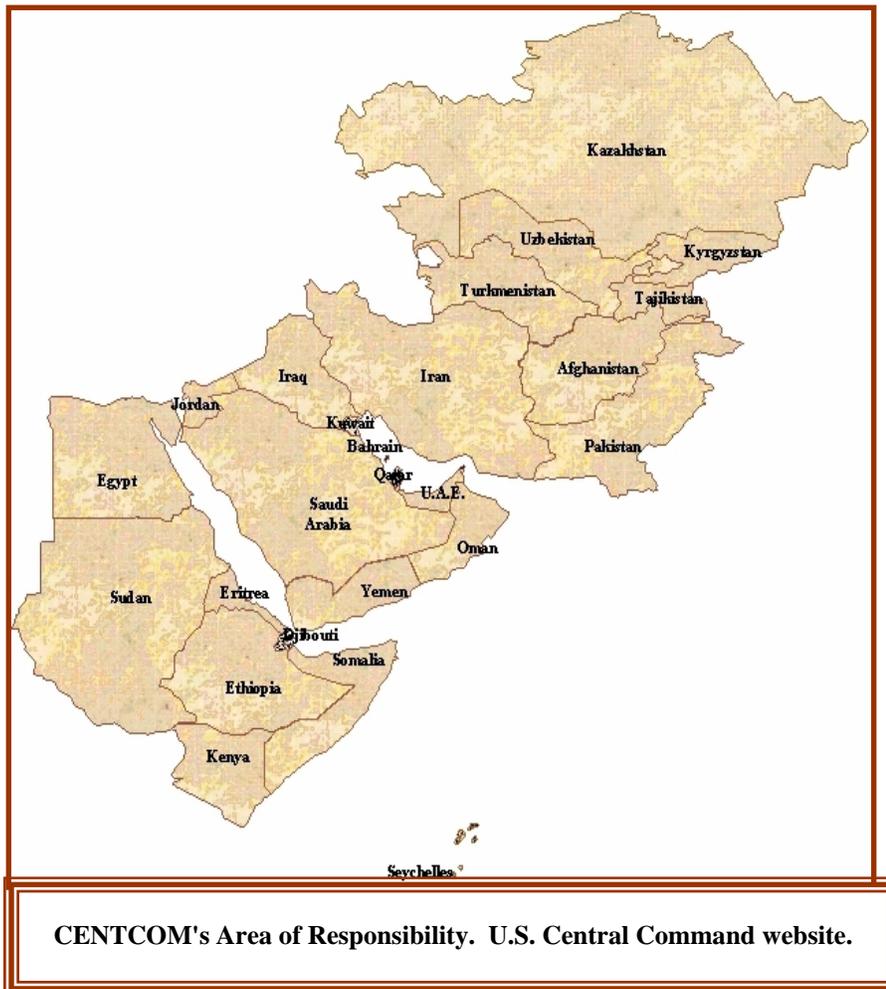
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<sup>a</sup> Submission by Dr. Steven Anders, QM Branch Historian

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One item of concern was the possibility of a battery shortage. CECOM anticipated that batteries, particularly the BA 5590 primary lithium battery used in several military applications would be in short supply and initiated actions to ensure a continued supply. Almost \$60 million was received in December 2002 and immediately put on contract. As a result, overall BA 5590 production increased from 60,000 batteries per month to almost 125,000 per month by April 2003.<sup>41</sup>

The CFLCC planners, realizing that they would not be able to stage in Saudi Arabia, began to augment existing facilities in Kuwait and to build new. The final bill came to more than \$500 million for a new airfield, fuel



pipelines, improvements at Kuwaiti Naval Base, housing and warehousing at Arifjan, and various supply items.<sup>42</sup>

In 2002, the mission of AMC Forward (SWA), now the LSE-SWA, was to coordinate, integrate, and synchronize all AMC activities in the U.S. Central Command (CENTCOM) area of operations. It served as the single point of contact for the CENTCOM and ARCENT (U.S. Army Central Command) commanders. By the summer of 2002, the AMC population was around 425, including Soldiers, DA civilians, and contractors. Up to and during the summer of 2002, missions of the LSE could be summarized as preparation of APS; execution of the Logistics Assistance Program (LAP), for example, technical expertise on the battlefield for readiness; and LOGCAP, or base services support to deployed forces.<sup>43</sup>

The CEG-SWA, located at Camp As Saliyah (or Sayliyah), was the command and control headquarters for the land-based APS-5 stocks in Kuwait and Qatar. In late July, COL Carl J. Cartwright assumed command of the LSE and CEG-SWA. Three sets of equipment were available in theater, apportioned to sites in Kuwait, Qatar, and Camp Arifjan.

By July, decisions had been made at the national level to begin download of repositioned afloat APS stocks while completing the movement of an APS combat brigade and the division base from Qatar. Critical to this movement – and the whole logistics buildup – were the 19 LMSR ships procured since ODS along with the C-17 aircraft.

For APS-5 (Kuwait), the plan was followed. Units were flown into Kuwait, and they fell in onto equipment arrayed on the storage lots at Camp Doha. After draw, units moved to the field and continued to train in their preparation for war.<sup>44</sup>

For APS-5 (Qatar), the plan was modified. Originally, the plan had units flying into Qatar, drawing their equipment, road marching to a nearby port, combat loading on ships, and sailing to the contingency area. In preparation for OIF, CEB-Q shipped 90 percent of the stocks (two plus brigades) via a combination of vessels over a number of months to Kuwait.<sup>45</sup>

### APS Equipment Sets, July 2002

**Kuwait.** The APS-5 Kuwait fleet was maintained by Combat Equipment Battalion-Kuwait (CEB-K). This fleet was stored at Camp Doha, Kuwait, a military installation located north of Kuwait City. At this location, a 2x1 BCT<sup>a</sup> was garrisoned that was transformed through modifications to tables of organization and equipment into a 2x2 BCT<sup>b</sup> in October of 2002. In addition to a full up BCT, the site stored a Combat Support Hospital, an MLRS Battalion, a newly formed Cargo Transfer Company, and a number of OPS. The equipment stored at Camp Doha, unlike the remainder of the APS staged around the world, was in steady use in support of ongoing operations and exercises for CFLCC/ARCENT (U.S. Army Central Command).

**Qatar.** The APS-5 Qatar fleet was maintained by Combat Equipment Battalion- Qatar (CEB-Q). This fleet was stationed at Camp As Saliyah, Qatar, an Army prepositioning site on the outskirts of Doha, Qatar. There was also an Ammunition Storage Point (ASP) named Falcon 78 some 30km from the camp where a 2x1 BCT (-) of ammunition was stored. In October 2002, the 2x1 BCT in the APS-5 (Q) fleet was enlarged to a 2x2 BCT. In addition to the division base, the Aviation Brigade (less Aircraft) sustainment stocks and OPS were stored at Camp As Saliyah. CEB-Q was also responsible for a Field Support Hospital stored in Bahrain.

**Camp Arifjan.** The APS-3 Prepositioned Afloat, upon download, became the Combat Equipment Battalion-Arifjan Provisional (CEB-AR (P)) set. This battalion was established at Camp Arifjan, Kuwait, in October 2002. In July 2002, the prepositioned afloat fleet had consisted of seven Large Medium Speed Roll-on/Roll-off (LMSR) vessels, two Class V (ammunition) ships, and two sustainment vessels. The seven LMSRs contained a 2x2 BCT and more than 100 echelon above division Unit Identification Codes (UICs). The two ships had 5,000 containers of ammunition, and the sustainment vessels contained 15 Days of Supply for a corps, which amounted to another 3,000 containers of Class I, II, III, IV, IX, and VIII supplies.

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<sup>a</sup> A 2x1 BCT consists of two armor battalions and one mechanized infantry battalion.

<sup>b</sup> A 2x2 BCT has two of each type battalion. The division base included all the Combat Support and Combat Service Support assets required to support the division and its BCTs.

Among the vessels used in this movement was the TSV-X1 (Theater Support Vessel) *Spearhead*, a ship leased by the Army beginning in September. The TSV could carry equipment from Qatar into the shallow



**TSV Spearhead departs from port in CENTCOM area of responsibility.  
U.S. Navy photo by Photographers Mate 1st Class Brien Aho.**

ports in Kuwait at speeds of up to 40 knots. The *Spearhead* and a second catamaran, the *Joint Venture* (High-Speed Vessel, HSV-X1) gave the Army speed into the shallow ports carrying large cargoes while developing a strategy to procure similar ships on a permanent basis.<sup>46</sup>

From the spring of 2002 until January 2003, the Joint Chiefs of Staff, CENTCOM, and DA made decisions to download APS afloat. The *USNS Watkins* was downloaded in Operation Vigilant Hammer I during July 2002, with the equipment staged and handed off at Camp Doha. The *Watkins* then sailed to Um Sa'id, Qatar, to conduct Operation Vigilant Hammer II, uploading the remaining half of the APS-5 (Qatar) 2x2 BCT for shipment to Camp Doha.<sup>47</sup>

Camp Doha was physically out of storage space after the Vigilant Hammer downloads, and a decision was made in August 2002 to open Camp Arifjan, which would be used for subsequent staging of downloaded afloat equipment.<sup>48</sup>



**LTC Ray Langlais. Photo by Dr. Robert G. Darius, Command Historian, U.S. Army Materiel Command.**

In September, it was reported that the Army had doubled the size of its stocks in Kuwait. “We have done a lot with prepositioned stocks in the Gulf, making sure they’re accessible and that they’re in the right spot to support whatever the President wants to do,” said The Honorable Thomas White, Secretary of the Army.<sup>49</sup>

*It was a “logistics war,” according to Lieutenant Colonel Ray Langlais, who helped run the main clearinghouse for equipment*

*at Camp Arifjan, and a different one from Operation Desert Storm because much of the materiel for fighting it was prepositioned on ships at sea or in warehouses in Kuwait.*

*Dozens, perhaps scores of warehouses, some as big as four American football fields, stretch as far as the eye can see in the dust-blown Camp Arifjan in the southern Kuwaiti desert. Tanks and other armored vehicles huddle under half a dozen massive shelters as big as the warehouses.*

*At a maintenance shelter, like a giant car port 200 meters long, mechanics tooled away at tanks, armored personnel carriers, trucks and other vehicles, some installing a new transmission, others replacing a weak link in a tread. The equipment is stored here temporarily or repaired before troops match up with it and drive north to desert camps near the Iraqi border.*

*In neat rows outside the perimeter fence stretch hundreds of trucks and HUMVEES – the rugged, wide-bodied vehicle that came to fame in 1991 as a replacement for the decades-old jeep. Nearby are a tent city and a landing pad for a dozen twin-rotor Chinook supply helicopters as well as a parking area for a few dozen vehicles serving the British Army.<sup>50</sup>*

The first LOGCAP planners deployed to SWA in September 2002. The majority of the planners joined the staffs of 3<sup>rd</sup> Army at CENTCOM and LSE-SWA. A few joined U.S. forces in Turkey to assist in planning for that theater. The LOGCAP Support Unit (LSU), a new AMC element composed entirely of Reservists, deployed to Kuwait in January 2003 for the first time in the unit's history.<sup>51</sup>

The LOGCAP program proved especially helpful to APS and LSE-SWA in the opening and developing of Camp Arifjan, where it built facilities for AMC personnel as well as units drawing equipment. Under LOGCAP, Kellogg, Brown, and Root (KBR) provided the manpower to assemble the FP modules.

*Today, the six Force Provider Modules and Festival Tent communities built under the LOGCAP contract provide bed-down for 15,500, and every day brings new requests," said Joyce Taylor of AMC's Program Management Office for LOGCAP.*

*I believe the most important aspect of a Brown and Root Contract to construct Force Provider units is that it drastically reduces the military logistics footprint on the battlefield," said LTC Rod Cutright, the senior LOGCAP planner for all of Southwest Asia. "We can quickly purchase building materials and hire third country nationals to perform the work. This means a small number of combat service support Soldiers are needed to support this logistic aspect of building up an area."<sup>52</sup>*

The use of contractors was essential to the success of this operation. They are the predominant work force for the Combat Equipment Groups. When the Qatar contractor, ITT, was asked to staff Arifjan in late September 2002, they quickly and capably relocated 40 percent (65 personnel) of the staff from Qatar to Kuwait to serve as the nucleus workforce for CEB-AR (P). Eventually, the ITT workforce grew to over 350 contractors. In addition to ITT, TAMSCO provided the communications, and Stanley provided database management.<sup>53</sup>

**Contractors on the Battlefield.**

The large number of contractors made for a very different type of operation than in the past and prompted AMC to establish a coordination team to account for all contractors in the area of operations (AOR). The so-called Contractor Coordination Cell, or 3C, was so successful that such a structure has been included in planning and doctrine for the future.

Mr. Rodolfo (Rudy) Chavez, first Chief of 3C, arrived at Headquarters, AMC in September 2002 to join a battle staff working plans to support the contingency for going into Iraq. In December, in briefing BG Boles, they pointed to the need to support contractors on the battlefield. The AMC Command Counsel had already determined that there were a lot of policies but no central accountability or consistent documentation. After he arrived in Kuwait, BG Boles discussed the issue with CFLCC and requested that HQ, AMC send forward a team to establish the necessary support and accountability.

Mr. Chavez arrived in Kuwait on February 24 with six people. Significantly, the AMC leadership had already worked one major, complicating issue. In January, AMC established a Memorandum of Agreement with the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA(ALT)) outlining responsibilities for “accounting for contractor personnel and coordinating logistics support for contractor personnel, who are supporting current Operations Enduring Freedom and Noble Eagle and subsequent or related operations.” Within four months, 3C had gained visibility on more than 5,725 U.S. Army contingency contractors in the CENTCOM Theater of Operations.

The 3C charter was to stand up an office that would gather data and track all U.S. Army, U.S. Citizen contingency contractors, and system contractors.<sup>a</sup> The team moved aggressively at the CONUS Replacement Center (CRC) and the Kuwait International Airport, as well as Camp Doha and Camp Arifjan, using a checklist it developed to identify contractors, to track their movements, and have knowledge of their name, gender, issued gear, shot records, company name, military sponsor point of contact, next-of-kin information, command, and location of duties.

This data was also used to identify those contractors who did not have Chemical Protection Equipment or Anthrax and Small Pox inoculations. This was a critical mission tasked to 3C by the Commanding General due to the serious threat contractors faced when hostilities started. Without the information 3C gathered, many contractors would have been without NBC (nuclear, biological, chemical) protection gear when Kuwait came under missile attack on March 19, 2003 and later.

3C used the data to work other difficult issues, too. A Soldier might come up to the office and say, “My piece of equipment is broke. I want to know where my contractor is. It’s still under warranty, and I need his help.” Or a contractor would come in and say, “I was called to support this operation. I support this system, but I don’t now who my employer is, I don’t know who my unit is, and I don’t know where to go.” So the team would help them out with transportation, movement, communications, coordination, and life support.

The cell might get a message from the Red Cross saying, “We have a Red Cross message from the states for this individual. He’s a contractor, but we can’t find him.” The team would pop up the data base and find out who the individual was, where he was assigned, who his company was, and get the message across.

As Mr. Chavez described it, 3C became much more than a *coordination* cell, it really functioned more as a *support* element, a contractor support element.

[3C was not tasked to gather data on sustainment contractors. There is a significant difference between a contingency contractor and a sustainment contractor. A contractor working for CFLCC for a specific operation is a contingency contractor; for example, a contractor working for HQ, AMC, a Program Manager (PM), or Program Executive Officer (PEO), or a unit contractor in support of OEF. A sustainment contractor is a contractor working in a long-term position such as at Camp Doha, which is part of a termed ARCENT operation and funded by the local Principal Assistant Responsible for Contracting.]<sup>a</sup>

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<sup>a</sup> Based on Oral History Interview with Rodolfo Chavez conducted at Camp Arifjan on April 21, 2003 by Dr. Robert G. Darius and Mr. Randy R. Talbot.

## OIF – Baghdad

In January of 2003, the National Command Authority had begun to deploy forces, and the mobilization Table of Distribution and Allowances (TDA) was activated. By mid-January, BG Vincent E. Boles had arrived in theater and was dual-hatted as the CFLCC Deputy C-4 and the Theater AMC Commander.



Starting on January 6, 2003, the 3<sup>rd</sup> ID(M) began to deploy, and AMC LSE-SWA issued equipment to the division through the first week of February from Camp Doha and Camp Arifjan. LSE-SWA continued issuing stocks to follow-on forces during February and March. Then, on March 20, the opening day of combat operations, the commander was ordered to move into Iraq and establish an operating element at Tallil Air Base. On March 22, COL Cartwright led a three-vehicle element across the breach line and into Iraq. They spent one night at forward Logistics Base Cedar and arrived at Tallil on March 22. Even while developing a rudimentary base camp, the logisticians began calling forward LARs to expedite the flow of repair parts and the repair of critical assets. Cartwright also called ammunition personnel (Quality Assurance Specialist – Ammunition Surveillance, QASAS)) to assist in the segregation of ammunition and the set up of an ammunition supply point. After 32 days at Tallil, Cartwright and his group returned to Camp Arifjan.<sup>54</sup>

On April 5, 2003, when elements of the 3<sup>rd</sup> ID(M) rolled through Baghdad on “Thunder Runs,” they rolled with equipment provided largely by AMC LSE-SWA. In 1990-1991, during ODS/S, the buildup of troops and equipment required months and shipment of extensive equipment and supplies from CONUS and Europe. In OIF, the APS program provided enough prepositioned equipment that enabled the 3<sup>rd</sup> ID(M) to fly into Kuwait, deploy rapidly, train in the desert, and to strike into Iraq quickly.

“I do want to thank the AMC community for their support in this,” said MG Buford Blount, Commander of the 3<sup>rd</sup> ID(M). “It’s clearly something we could not have done without us working as a team. It took a lot of good teamwork to make all of this happen, and everybody was focused on getting the job done. I think our people integrated very well early on and made it happen.”<sup>55</sup>

From a minimal presence in theater, the AMC force grew to more than 8,500 by the cessation of Decisive Operations in May 2003. In terms of prepositioned equipment, AMC provided stocks from ships, including 6.4 million MREs (meals ready to eat) and 58 thousand tons of ammunition. Prepositioned stocks on land included another 8 thousand tons of ammunition as well as 324 tanks, 374 Bradleys, 9,426 High Mobility Multi-purpose Wheeled Vehicles (HMMWVs), and 7,074 other trucks.<sup>56</sup>

The 3<sup>rd</sup> ID(M), in its rapid deployment, left some of its best equipment at home, including Bradleys with advanced laser-targeting systems. One officer commented, “We got trucks here that are brand new, and we’ve got trucks that are older than the drivers driving them.” A veteran said, “It’s unbelievable. Some of the trucks I drew out of prepositioned stocks when we arrived are the same stuff I turned in back in ’91.”<sup>57</sup>

A support operations officer complained that, although the unit had conducted several scrubs of the draw and the designated equipment list prior to deployment, the APS grid set did not reflect the equipment listing that was expected. He wrote that it took eight additional supplemental draws from APS to get the battalion all the equipment necessary.<sup>58</sup>

There was also the issue of high expectations. As an officer serving with one of the LSE-Forwards explained: “They set the bar so high. We were expected to be like a rental car agency. You know, cars come from a rental

car lot and work perfectly. Well, this is 20- and 30-year old equipment and designs that are 30 and 40 years old. And this equipment sits on a boat. Things break.”<sup>59</sup>

In MG Blount’s view, it balanced out. “None of that was a surprise. I mean that’s what we planned for as a general rule. We knew what was supposed to be in APS, and we knew some of our stuff at Fort Stewart was newer. The trucks were older, but across the board, everything was in good shape. Where there was a radical difference in capability, we would draw stuff from Fort Stewart. Like we brought our Linebackers for our air defense systems. And we had time to adjust and teach people how to drive with the clutches as we needed to. If you know it, you can train for it.”<sup>60</sup>

**Turkish Episode and Northern Gambit.** Original plans called for the 4<sup>th</sup> ID to move through Turkey and enter Iraq from the north. Plans were in place, the route had been prepared, and equipment was loaded on ships in the Mediterranean waiting to be unloaded. However, in the end, the Turkish government refused passage through the country, and those ships had to move through the Suez Canal and into the Persian Gulf to Kuwait. Most of the 4<sup>th</sup> ID Soldiers then flew into Kuwait and linked up with their equipment.

Meanwhile, in March 2003, in a major airborne operation, Soldiers of the 173<sup>rd</sup> Airborne Brigade parachuted into Northern Iraq. CEG-E issued the Immediate Ready Company from its storage location in Central Europe to reinforce the Brigade. CEB Livorno’s skilled Italian workers and U.S. Soldiers and civilians were key supporters in the successful operation.<sup>a</sup>

### **OIF – Balad/Anaconda and LSE-Iraq**

U.S. forces took and occupied Balad in the middle of April 2003. Balad Air Base is located about 70 kilometers north of Baghdad. Formerly the al-Bakr Air Base, it was the site of the Iraqi aviation academy. Balad/Anaconda, occupying a 25-square kilometer site, became the strategic logistics hub for U.S. and coalition forces in Iraq and is now home to about 20,000 U.S. and coalition troops.

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<sup>a</sup> David Josar, “4<sup>th</sup> ID Lands in Kuwait,” Stars and Stripes” (March 3, 2006), website accessed on March 3, 2006; also AMC LSE-SWA, *We Will Not Falter*, p.30.

By April 13, the lead elements of the 4<sup>th</sup> ID were moving from Kuwait past Baghdad, and they began the attack on April 16. The 1<sup>st</sup> BCT, supported by the 299<sup>th</sup> Engineer Battalion, attacked to clear the airfields at Taji and Balad and, then, moved north towards Tikrit.<sup>61</sup>

BG Charles W. Fletcher, Jr., Commander, 3<sup>rd</sup> COSCOM was with the Assault Command Post (ACP) at Balad. The ACP itself had been sitting at Logistics Support Area (LSA) Dogwood and jumped from there to Balad and was sitting there, waiting for the 4<sup>th</sup> ID troops to clear the base.

The 3<sup>rd</sup> COSCOM had placed everything before they went in. They had planned, practiced, and studied extensively, taking lessons from the Balkans and Afghanistan and practicing in Poland, in two Victory Strike exercises. They had extensive aerial photography, and they had laid it out – fuel here, ammo here, and Corps Distribution Center there, etc. They planned from the beginning to bring the Air Force into Balad. BG Fletcher brought an Army construction engineer battalion into Balad within three days and worked a general plan: Fill holes in the runway to bring in the C-130 Hercules; then move along until you have 11,000 feet; and then broaden the taxiway for the strategic airlift.<sup>62</sup>

Later, friction arose over space issues, largely because, going in, it was not thought that Balad would be a major site. Much more joint effort went into planning for taking and using Tallil. Then, too, initially, it was assumed that U.S. forces would be down to about one division by the fall of 2003.

In 2004, the AMC Lessons Learned Team conducted a study of issues arising during the development of Balad/Anaconda, an effort in which the AMC History Office assisted.

The study identified four major problem areas:

- Problems with joint planning precluded an efficient flow of forces into Balad to establish the air base.
- Lack of knowledge and training on Air Force force flow and air base establishment made further planning difficult for Army tactical leaders and added to confusion in eventual reorganization.
- A lack of flexibility and an established airfield planning guideline hindered quick reaction when forces shifted to Balad.

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- Difficulty in determining responsibility and gathering resources for joint expeditionary airfield management caused unnecessary frustrations on the part of both Army and Air Force tenants.

The study then offered several recommendations:

- Continue and build upon the Air Force Global Assessment Team (GAT) concept as a source for airfield establishment capabilities.
- Expand the capability to open new strategic airfields through joint tactical operations; place GAT capabilities with expected seizure forces.
- Army should look to develop an immediate Base Support Package, or Expeditionary Base Support Battalion (EBSB).
- Create a joint guide for Air Force requirements as an expeditionary airfield.
- Involve Army tactical and operational planners in Air Mobility Training.
- Employ joint exercises for training and further revision of airfield establishment guidelines.<sup>63</sup>

The 3<sup>rd</sup> Battalion, 58<sup>th</sup> Aviation Regiment, Army Air Traffic Services established Balad Southeast Army Airfield on April 20, 2003. Also, that was the same day the 864<sup>th</sup> Combat Engineer Battalion (Heavy) arrived. LTC Scott Fehnel, Commander of the 864<sup>th</sup>, later reported, “We cleared the runways of ‘dead’ tanks and other debris and had a 5,000 foot space ready to receive a C-130 within six hours.”<sup>64</sup>

On April 18, the 320<sup>th</sup> Engineer Company (Corps) (Topographic) departed Camp Virginia, Kuwait, for LSA Anaconda, arriving on April 21. The next day, the survey platoon linked up with the 12<sup>th</sup> Aviation Air Operation at Balad Airfield and conducted reconnaissance for their first safety navigation aid obstruction geodetic survey. They went on to conduct the Ron Brown Air Field Safety Surveys, which the DoD mandated to ensure that airfields be mapped into global positioning/satellite-based navigation for precision aircraft approaches.<sup>65</sup>

The facility was initially used by helicopters. In fact, the airfield came to support more than 180 tenant rotary-wing, fixed-wing, and unmanned aerial vehicles, as well as transient aircraft. The first C-130 arrived on May 4.

Back in April, BG Boles had called COL Robert J. Spidel, then the Commander of AMC Forward-Europe, to ask if he would lead the command and control (C2) organization for the AMC LSE elements already in Iraq. Spidel departed Frankfurt on May 12, arriving at Kuwait International Airport that night. Mr. Jim Branham had arrived in Kuwait in late April 2003 as the Logistics Assistance Officer for the XVIII Airborne Corps. When it was clear that the 82<sup>nd</sup> Airborne Division would not be coming to Kuwait, BG Boles made the decision to make Branham the deputy to COL Spidel for what was to become LSE-Iraq.<sup>66</sup>

**The following LSEs were already in Iraq.** The 101<sup>st</sup> Airborne LSE, commanded by LTC Bill Huggins was located in Mosul, Q West, and Tal Afar. The 3<sup>rd</sup> ID LSE commanded by LTC Joe Merlo was in LSA Dogwood, just south of Baghdad. This team was to redeploy around May 21. The 173<sup>rd</sup> Airborne Brigade LSE was located in Kirkuk and was commanded by CW4 Bobby Ingram. The 4<sup>th</sup> ID LSE was located at Tikrit North (LSA Sycamore) and was commanded by LTC Kevin McCall. The 3<sup>rd</sup> Armored Cavalry Regiment (ACR) LSE was located at Al Asad, west of Baghdad and Fallujah, and was commanded by LTC Brian Amberger. Finally, the 3<sup>rd</sup> COSCOM LSE was located at LSA Anaconda in Balad, just north of Baghdad. LTC Russ Price commanded this LSE. The 1<sup>st</sup> Armored Division LSE was commanded by LTC Lola Darden and deployed to Dogwood for relief of 3<sup>rd</sup> ID LSE around May 21. The 2<sup>nd</sup> ACR LSE, under the command of Major Vince DeBray also deployed around May 21 to Camp Muleskinner near Al Rasheed Airbase on the eastern side of Baghdad.<sup>a</sup>

COL Spidel and Mr. Branham started to assemble a staff while located at Camp Arifjan. Originally it was unclear whether this ad hoc organization would operate out of Kuwait or Iraq. However, it was quickly decided to establish an AMC presence at Balad, to include the MSC Senior Command Representatives to assist in managing the LARs and to provide maintenance expertise to the Commander. For one thing, most of the LARs were already in Iraq, and their job was to provide real-time technical advice. Then too, it was very important and helpful to have a colonel forward where the C-4 of the Combined Joint Task Force 7 (CJTF-7, or V Corps) – or its Deputy Commanding General (DCG) – could easily reach out and touch him.<sup>67</sup>

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<sup>a</sup> Based on Spidel, “LSE-Iraq History”

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Spidel flew into Balad via C-130 on May 28 to establish LSE-Iraq. He set up his communications and shared a facility with the 3<sup>rd</sup> COSCOM LSE, about a 5-minute walk from the V Corps Rear and the 3<sup>rd</sup> COSCOM HQ. This provided AMC's "single point of contact" for services. The main body, under Mr. Branham, flew into Army Sustainer Airfield/Balad Southeast on June 6. By June 10, the LSE headquarters had established its communications with AMC SWA in Camp Arifjan and with the LSEs throughout Iraq. During June, the V Corps Rear moved to Camp Victory near Baghdad, but COL Spidel and the LSE-Iraq stayed with 3<sup>rd</sup> COSCOM at LSA Anaconda.<sup>68</sup>

The primary logistics concerns in June were the significant shortages – both actual inventory as well as distribution – of M1 Abrams track and road wheels, of HMMWV and Heavy Equipment Transporter (HET) trailer tires, and of aviation parts. The Operational Tempo (OPTEMPO) was very high, and equipment was being used at much higher rates than planned. By late June, there was a shortage of Bradley track shoes, and Bradley operational rates began to drop.<sup>69</sup>

By July the situation on M1 track had begun to stabilize, but Paladin and M113 track was extremely short and required close management. About this time, a HET trailer tire contract was negotiated between the U.S. Army Tank-automotive and Armaments Command (TACOM) and Michelin, and the plant in Karlsruhe, Germany, started shipping them in 4000 set increments to Kaiserslautern, Germany, for onward shipment to Iraq and Kuwait. Theater distribution remained the biggest concern as units were forced to rely on their own expeditors to ensure parts reached them.<sup>70</sup>

In August, the situation with Bradley track became a full-blown crisis. At one time, there were more than 220 Bradleys down for track. The situation was made worse by the fact that, due to congestion and confusion in the Theater Distribution Center (TDC), track was in Kuwait but was not being moved north. This issue was highlighted at a maintenance meeting held at Anaconda in August, where it was determined that there were Corps Theater Automatic Data Processing Service Center issues causing problems. In September, the Bradley track situation started to improve dramatically. By October, the track situation had gotten much better. Bradley track was still a concern, but the major problems of August had been rectified, and the situation was much more manageable.<sup>71</sup>

Back home, AMC pushed to increase production. Tank track shoe production went from 15,000 a month, pre-OIF, to 50,000. Similarly, Bradley track shoe production grew from 28,000 to 70,000 a month. And the rebuilding of track was significantly increased at Red River Army Depot.<sup>72</sup>

The LARs in the LSEs were performing critical assistance for their units. As one noted later, “When the system goes down, peoples’ lives are threatened, and to get that CECOM LAR to those locations, the units will divert. They’ll provide a Blackhawk in some cases, or they’ll provide convoys. That’s how important that CECOM LAR is to that unit’s force protection and readiness.”<sup>73</sup>

At the same time, the LSE-Iraq personnel were dealing with their own problems. As TDA units, the LSEs had only limited property, transportation, and power generation capability. Personnel frequently had to scrounge for vehicles and generators from friendly units. Mr. Branham later described the experience as “worse than being a professional beggar.”<sup>74</sup>

Moreover, LARs were very uncomfortable traveling to various locations to support their units. They had no personal weapons, only Viet Nam era flak vests, vehicles that were unreliable, and no mobile communications since there was no cell phone network available in Iraq. LAR movement, especially in the Baghdad area became very challenging. Movement by air was the safest way of getting around, but it was often unreliable.<sup>75</sup>

In addition to the normal LAR complement, the LSEs in Iraq had many other AMC and sister organization assets. Significantly, LOGCAP had been at Balad/Anaconda since the first moments that LSE-Iraq arrived, providing critical support to V Corps and 3<sup>rd</sup> COSCOM. The 101<sup>st</sup>, 4<sup>th</sup> ID, 1<sup>st</sup> AD, and 3<sup>rd</sup> COSCOM all had Test, Measurement, and Diagnostic Equipment (TMDE) detachments supporting the Iraqi Theater. There was already a small CECOM Forward Repair Activity (FRA) in Tikrit, and there would soon be one at Baghdad International Airport. The Army Oil Analysis Program (AOAP) lab was co-located with the LSE at Anaconda. There was also a TAMSCO contractor-run battery shop with the COSCOM LSE at Anaconda. Finally, the Team Armor Partnership (TAP) package was also co-located at Anaconda.<sup>76</sup>

By September, AMC LSE-Iraq had to bring personnel from Europe to help run a growing operation at Anaconda. The CECOM FRA was up and

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functioning by October 1 and immediately began doing major business. The Standard Army Maintenance Information System (STAMIS) and TIER III repair were an immediate, major success such that more support from Fort Monmouth would be required. The Intelligence/Electronic Warfare (IEW) and Regional Support Command missions remained split, with some operations moved to Balad, but the bulk of the mission still ongoing in the Baghdad area, where many of the supported units were located.<sup>77</sup>

On October 19, the HMMWV Service Center (now the HMMWV *Support Center*, HSC) opened its doors at Anaconda. Although operating out of a temporary facility, the team of employees from Anniston and Red River Army Depots serviced more than 500 HMMWVs by November 17.<sup>78</sup> The HSC primarily performed services and limited organization and direct support tasks, with an average workload of 40 vehicles daily. During the first six months, technicians at the HSC serviced 2,600 HMMWVs and installed 1,128 sets of Add-on Armor.<sup>79</sup>

In January 2004, the first Mobile Tire Service Center (MTSC) procured by TACOM was shipped to the HSC at Balad, further expanding the range of capabilities.<sup>a80</sup>

The Air Force arrived in October. The first C-5 Galaxy arrived in Anaconda/Balad SE Airfield on November 12 from Dover Air Force Base, DE. “This event is a significant milestone in support of the global war on terrorism and continuing joint operations in this region,” said Col Frank Padilla (USAF), commander, 332<sup>nd</sup> Air Expeditionary Wing (AEW), Detachment 1.<sup>81</sup>

LTC Bruce Williamson, USAF, Commander, 332<sup>nd</sup> Expeditionary Mission Support Group, commented: “The establishment of Balad and this aerial port – our primary mission – would never have happened without the outstanding efforts of both the Army and Air Force working together. To bring in C-17s and C-5s, we needed room to park them, refuel them, offload and upload

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<sup>a</sup>In FY 04, TACOM purchased six MTSCs for use in Iraq, Afghanistan, and Kuwait to alleviate the tremendous tire changing burden in SWA and provide increased safety for U.S. troops. These MTSCs are fully outfitted, self-contained tire and wheel assembly/disassembly and repair shops. They come equipped with a tire changer, air compressor, generator, runflat inserter/extractor, tire cage, jib crane, hand tools and air tools. They are also air-conditioned and heated in order to maximize operator productivity and comfort.

them, and space for cargo and passenger terminal operations 24 hours a day. That in itself was a challenging and frustrating mission, especially when the airfield and base areas were already full with Army units.”<sup>82</sup>

### **Defense Logistics Agency – From the Beginning.**<sup>83</sup>

Known to many as the warehouse, the Defense Distribution Center (DDC) consists of a network of 26 distribution depots in the U.S. and overseas that receives, stores, issues, packs, preserves, and provides worldwide transportation for supplies and parts. DDC presence in SWA began with a request from CENTCOM for DLA to provide wholesale distribution support in theater with a goal to improve customer wait time, reduce transportation costs, and improve overall readiness. As a result, in December 2002, DDC stood up a forward site in Bahrain, prepositioning 35 different items used mainly for force protection. The first shipment of 158 containers was shipped out from the Bahrain site, designated DDZZ, on January 27, 2003.

Later in 2003, CENTCOM requested a permanent DLA presence in Kuwait. DDC met this challenge with a phased approach, starting in May 2004 with dedicated truck, military air lines of communication, and surface shipments from DDC’s distribution center at Germersheim, Germany.



**Defense Distribution Depot Kuwait, Southwest Asia (DDKS)  
Photo submitted by DLA**

In the second phase, DDC established an interim contingency contract operation in Kuwait that became operational on August 30, 2004. The

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Defense Distribution Depot Kuwait, now designated DDKS, assumed the mission previously assigned to DDZZ. The third phase involved a contract competition that resulted in the award to Public Warehousing Company in August 2005.

At the same time, DLA implemented other initiatives to meet its worldwide responsibilities. Coming on line in April 2004, Defense Distribution Depot Sigonella (DDSI) is strategically located on Sicily in the heart of the Mediterranean. DDSI, with capability to provide the full complement of physical distribution services, is well situated to support all four Service components as well as other U.S. agencies located south of the Alps.

**Material Processing Centers.** In 2002, in one especially effective process improvement, DDC joined forces with the Navy to develop an innovation in customer service, Material Processing Centers (MPCs), which provide specialized material handling services for local delivery to Navy ships. DLA set MPC in motion at DDC distribution centers in Norfolk, VA; San Diego, CA; Puget Sound, WA; Pearl Harbor, HA; Jacksonville, FL; and Yokosuka, Japan, all of which have many Navy customers.

In the traditional Navy supply system, material was delivered to the ship, then taken aboard to be broken down and sorted for storage or issue to work centers on the ship. Under MPC, DLA performs much of this effort before materials are delivered to the ship, thereby saving both time and manpower. “The Navy is in the process of moving work from ships to shore to facilitate downsizing of ships’ crews,” explained CAPT James Hagarty, USN, Commander, DDC Distribution Center Norfolk. “Eventually, more than 50 surface ships will benefit from MPC.”<sup>a</sup>

On the other side of the world, DLA established Defense Distribution Depot Guam Marianas (DDGM) in October 2004 to provide forward stock positioning in the western Pacific. Most recently, DLA established the Defense Distribution Depot Korea (DDDK) in January 2005, based on a

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<sup>a</sup> DLA chapter, pp. 25-26

support request from the Army's 19<sup>th</sup> TSC. The DDDK's primary mission is to provide enhanced physical distribution services to U.S. Armed Forces located on the Korean Peninsula.

The establishment of the Defense Logistics Agency Central Command (DLA-C) in October 2004 marked another attempt to adapt organization and procedures to better serve customers by centralizing command and control to provide a single touch point for all things DLA in theater. Having started with just a commander and deputy, plus two existing liaison officer positions, DLA-C took operational control of deployed DLA Contingency Support Teams (DCSTs) in Kuwait, Iraq, and Afghanistan, as well as the Customer Service Representatives in Kuwait, Bahrain, and Qatar.

These DCSTs are comprised of military and civilian personnel who are deployed to locations where military units are actually using supplies they have requisitioned. DLA has described the DCSTs as “the eyes and hands at



**Members of the DLA Contingency Support Team Kuwait, Fall 2004. Columbus Federal Voice, February 9, 2005.**

the tip of the spear.” Team members provide on-site DLA logistics, asset visibility support, fuels management, and disposal services. In addition, the teams gather critical intelligence on what works in supply and support programs.

In 2006, DLA launched the latest DDC initiative, the Deployable Distribution Center (DDXX). The DDXX is a cadre of distribution personnel with equipment, which is ready to deploy to provide distribution services in the event of a natural disaster inside the continental United States. It is a deployable and scalable distribution operation that can receive, store, issue, transship, and maintain in-transit

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visibility for items needed for relief efforts, such as food, water, and construction material.

“DDC played a key role in the hurricane relief efforts of 2005 by processing more than 65,000 requests for support,” said DDC Commander BG Michael Lally, U.S. Army. “DDXX allows the Department of Defense to better serve the country during a natural disaster.” DDXX can be deployed in response to requests from federal or state agencies, which have been approved by the United States Northern Command (NORTHCOM) and DoD. When not deployed, DDXX is a 66-member team split between two DDC distribution centers: Defense Distribution Depots Red River, TX (DDRT), and San Joaquin, CA (DDJC). A few members of the team are stationed at DDC headquarters in New Cumberland, PA.<sup>84</sup>



**Dewey Darley (second from left), a customer account specialist from Defense Supply Center Philadelphia, poses for a photo during a site survey with the Command Joint Task Force 180. The group is responsible for ordering food to sustain troops deployed in Afghanistan and Uzbekistan. The survey was done to evaluate the ongoing improvements and inventory practices of the Class 1 site at Bagram Airbase in Afghanistan. *Provider Update*, Fall 2003.**

MG Hawthorne J. Proctor, then DLA’s Director of Operations, once claimed, “If a Soldier, Sailor, Airman, or Marine eats it, wears it, fights with it, maintains their equipment with it, or in some manner burns it for fuel, DLA likely provided it.”<sup>85</sup> In the years since September 11, DLA, using its global resources, has supported OEF and OIF with more than 187 million operational rations, 3.3 billion gallons of fuel, and almost 6 million humanitarian daily rations for the local populace. Ongoing support includes supplying troop support items such as boots, body armor, and cold weather gear. More than 3,300

“pure” (material for a specific unit or group of customers in the same area) pallets are distributed every month. To accomplish this mission, DLA usually has about 100 personnel forward deployed to the region.



## **Chapter II**

### **Transforming and Reorganizing while Fighting**

As part of his overall push to transform the Army, GEN Eric K. Shinseki, Chief of Staff, Army (CSA), challenged the logistics community to address long-standing issues and obstacles. When addressing a meeting of logisticians, GEN Shinseki used a coiled rattlesnake as an analogy to explain the relationship between warfighters and logisticians. A coiled rattlesnake has a superior ability to strike quickly and with force, while an uncoiled snake's striking power is minimal. Logisticians, Shinseki noted, provide the wherewithal for the warfighters to strike effectively, quickly, and with great power.<sup>86</sup>

As GEN Kern explained, "If we're really going to change the Army, if we're going to transform the Army, we cannot do it without transforming the logistics of the United States Army. It's going to be an essential piece of it."<sup>87</sup>

The logistics community, recognizing the need to adapt to new threats and changing conditions, moved to implement lessons from ODS and to take advantage of new and emerging technologies, especially in digital capabilities. The "Revolution in Military Logistics" of the late 1990s and the Log Transformation Task Force (LTTF) of 2002 pushed process improvements and enablers. Meanwhile, AMC aggressively pursued initiatives to integrate retail and wholesale supply systems into one supply chain and to move from a supply base to a distribution focus. Others, including the Defense Logistics Agency (DLA), were doing much the same to transform their business practices.

At the same time, AMC instituted structural changes to improve management effectiveness. Seeking to improve coordination and provide better services, the Commanding General (CG), AMC worked with the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA(ALT)) to implement the Life Cycle Management Command (LCMC) concept. The goal of the LCMC is to provide an integrated, holistic approach to product development and system support by fostering closer working relationships between and among developers and sustainers across the life of the system.

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To meet the changing environment, AMC preached the need for a robust and efficient industrial base. To this end, it emphasized organizational efficiencies, partnerships with private industry, and continuous process improvements. It also took advantage of the Armament Retooling and Manufacturing Support (ARMS) program and the Arsenal Support Program Initiative (ASPI).

### **Logistics Transformation**

**Ammunition.** Management of ammunition was one critical area addressed by the LTTF in a solution that embodied two major transformational themes: integration of retail and wholesale systems into one supply chain, and movement from a supply base to a distribution focus.

During the 1990s, the Army had adopted a system of “tiers,” in which the Continental U.S. was divided into three geographic regions, each with a set of depots. Designed to meet the needs of the Time Phased Force and Deployment Data planning process, the “tiered” system did not match requirements of a military increasingly using “call forwards” and flexible plans. MG McManus explained: “Probably the biggest area we learned on the ammunition side was we had stocks malpositioned as we went from a time phased force deployment data-based approach to a deployment order kind of structure.”<sup>88</sup>

In addition, there was no central control agency. Installations held Unit Basic Loads, while AMC held sustainment stocks, and Operations Support Command (OSC) had no visibility over the Army’s retail ammunition supply system or over the requirements of the other Services.

The Commanding General of the U.S. Army Forces Command (FORSCOM) challenged MG McManus to develop a plan to manage all FORSCOM ammunition stocks. The idea was for OSC to use its management expertise and automation to control all training ammunition stocks as well as deployment and mobilization stocks. Part of the intent was to reduce the amount of ammunition held in installation ASPs and to increase OSC visibility of the entire stockpile.<sup>89</sup>

Preparations for OEF and OIF highlighted these concerns and the limitations of the “tiering” concept. While OSC began to distribute

sustainment stocks, deploying units were asking for items to complete their ABLs, but because it had no visibility over the retail system, OSC had no way to plan for these requests. Furthermore, because it lacked visibility over the ammunition requirements of the other Services, OSC had not been able to plan for simultaneous demands from the Army, Navy, Marines, and Air Force.

These issues, extremely painful at the time, encouraged development and implementation of Centralized Ammunition Management (CAM). Working under the LTTF umbrella, the U.S. Army Joint Munitions Command (JMC, then a subcommand of AFSC) used Lean and Six Sigma principles to meld training and deployment requirements with stocks on hand into a consolidated system with total asset visibility and end-to-end tracking. Sustainment stocks as well as installation-based stocks are managed from JMC at Rock Island. Ammunition requirements are aggregated and sourced at the regional level, leading to better stock rotation, reduced transportation costs, and improved distribution management.<sup>90</sup>



**Pallets of 2,000-pound aerial bombs await transport to the Iraqi theater of operations from McAlester Army Ammunition Plant. U.S. Army photo by Jerri Mabrey.**

During OIF Phases I-III, CAM assisted in the rapid and efficient deployment of ammunition to Active, Reserve and National Guard, and joint forces. Over 99 percent of all shipments were on time. Specifically, CAM supported the mobilization of over 150,000 people on 30 different sites. Even

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as Phase III was ongoing, the CAM system was already planning the retrograde of ammunition to ensure that stocks returning from theater went to the best location, not just the old Tier I depots.<sup>91</sup>

By the end of 2005, JMC had resupplied former FORSCOM sites as well as the Training and Doctrine Command (TRADOC) installations and National Guard Bureau sites in the Continental U.S. (CONUS). This brought the total number of CONUS sites supported for resupply to 78. The concept is to provide limited storage of basic load assets at installations with the majority of assets being stored at a depot.<sup>92</sup>

**Modernization.** Since the end of the first Gulf War in 1991, the Army has committed itself to transformation to meet the challenges of the post-Cold War strategic environment. Successive Chiefs of Staff have tied logistics modernization directly to support for deployment of combat forces overseas and to the development of a logistics base to sustain them. As part of that process, Army leaders recognized the need to incorporate developments in communications and electronics, information management, and modern business practices into what they termed a Revolution in Military Logistics.<sup>93</sup>

ODS left two competing legacies for the logisticians to reconcile. On the one hand, they had performed near miracles in building the logistical base which launched the victory in the desert. With only a few months left to serve as Chief of Staff, GEN Carl E. Vuono was reluctant to consider drastic changes to the force in the wake of its resounding victory.<sup>94</sup> Many of his junior and noncommissioned officers agreed. Returning to the United States with a deep sense of satisfaction, they were almost smug. As one senior officer noted, "We were living in the euphoria of having fought the war we wanted to fight for fifty years."<sup>95</sup>

On the other hand, some of the Army's leaders were reluctant to consider the Gulf War a blueprint for future organization and doctrine. The initial deployment of one brigade of the 82<sup>nd</sup> Airborne Division to stand against an expected Iraqi armored advance, they reasoned, reflected the Army's inability to deploy its own heavy forces in a timely manner.<sup>96</sup>

LTG William G. Pagonis, for one, recalled the ad hoc way in which the Army opened the theater and prepared to receive the deploying forces. "Every combat service support unit that came in that was not assigned directly

to the XVIII Airborne Corps came under our auspices. So, in essence, we end up forming a support command inadvertently because we had to continue the log support.” Pagonis also noted the lack of sufficient air and sea lift to transport spare parts and supplies, and the lack of sufficient materiel handling equipment to move those supplies once they arrived in theater.<sup>97</sup>

After GEN Vuono’s retirement, subsequent Chiefs of Staff expressed support for Army modernization to keep up with the rapid growth of technology, particularly in the fields of communication and information management. GEN Gordon R. Sullivan promoted digital technology as the keystone for his vision of the future force, which he designated Force XXI. He oversaw the development of an Army Strategic Logistics Plan, which he described as "a technologically advanced, seamless system which will provide world-class support during peace or war."<sup>98</sup>

GEN Sullivan’s successor, GEN Dennis J. Reimer, expressed many of the same ideas by encouraging the Army's general officers to embrace the Revolution in Military Logistics: "We have a clear vision for 21<sup>st</sup> century global military logistics. It is a system based on efficiently distributing resources, rather than stockpiling supplies, providing the right support, at the right time, in the right place, any place on the earth."<sup>99</sup> Along with his DCSLOG, LTG John G. Coburn, GEN Reimer identified six elements of the Revolution in Military Logistics. He saw the first as a seamless logistics system that eliminated choke points between producer and consumer. The second element was a distribution-based process that delivered sustainment from afar rather than creating large stockpiles – he called them “iron mountains” – in theater. The third was an agile infrastructure, an ability to provide logistical support whenever and wherever it was needed. Total asset visibility, the fourth element, would enable logisticians to identify repair parts and supplies no matter where they were in the pipeline. The fifth, rapid force projection, identified the requirement to deploy amply supplied combat forces anywhere in the world on short notice. The sixth point, an adequate logistics footprint, suggested that sufficient support units should always be available in-theater to accomplish a mission.<sup>100</sup>

The collapse of the Soviet Union in 1991 and the reunification of Germany that followed created within the United States an anticipation of a "peace dividend." Despite the successful deployment to the Persian Gulf, many political leaders questioned the need to maintain large military forces in

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the absence of any comparable threat. The strength of the Active Army declined from 765,287 at the beginning of Fiscal Year 1990 to 491,000 at the end of Fiscal Year 1996. Tighter budgets and increased operational requirements for the forces that remained caused senior commanders to shift funds for maintenance and spare parts to other, more critical requirements.<sup>101</sup>

**Military Contingencies.** U.S. military commitments to Somalia, the Balkans, and the Middle East during the 1990's exposed shortcomings in the Army's ability to deploy forces in response to a crisis and to sustain them once they arrived in theater. As noted earlier, the Army attempted to mitigate its shortfall in strategic lift by prepositioning sets of heavy equipment in theaters where it was likely to deploy. If these forward positioned assets allowed the Army to put a heavy brigade on the ground in Southwest Asia in just four days, however, they did little to solve any of the problems of sustaining that force once it was in the field.<sup>102</sup>

Operation Restore Hope in Somalia, 1992-1993, was the first major deployment of U.S. military forces in an operation other than war since the end of the Cold War. Although much of the initial logistical support for the operation came from the U.S. Marine Corps Maritime Prepositioning Force, the effort also took advantage of Army stocks prepositioned afloat. Primitive conditions in Somalia required the deployment of nearly 4,000 engineers to repair airfields and open supply routes. Despite these complications, CENTCOM Commander-in-Chief, Marine Corps GEN Joseph P. Hoar, was, on the whole, well satisfied with the support his forces received. In his opinion, the prepositioned stocks and the nation's strategic airlift constituted a unique capacity to support whatever force projections the contemporary world's circumstances might require.<sup>103</sup>

The Army's experience in the Balkans, which began in 1995, added to the service's portfolio several more important lessons on the conduct of logistical operations in the post-Cold War environment. After years of operating in and around well-developed base areas in Germany, Army forces deploying into Bosnia in 1995 and Albania in 1999 found an almost nonexistent theater infrastructure. Heavy U.S. equipment tore up roads and damaged the few support facilities that existed.<sup>104</sup> As one senior Army logistician observed, "When we went into Albania, it was a mud pit, and you were walking in with nothing."<sup>105</sup> Army units deployed without enough linguists and civil affairs

personnel who could coordinate host nation support, including rail and truck movement and supply distribution vital for the support effort.<sup>106</sup>

As the deployment to the Balkans continued, logisticians developed solutions to many of the problems that bedeviled them. One issue of this sort was the inability to identify the contents of incoming supply pallets without physically opening them up. This tied up a number of Soldiers at airfields and reception points who might have been employed elsewhere. In response, the logisticians adopted a radio frequency tag system already in use commercially. The tag allowed supply personnel to use a handheld sensor that could interpret the tags and identify critical materiel. Using it, Soldiers could identify and track shipments at any point in the pipeline. They could also program the scanners to identify which pallets scattered about an airfield contained the most urgently needed repair parts or supplies.<sup>107</sup>

**Vision for Transforming.** Between 1998 and 2001, the Army published a number of papers and studies that described its vision for the future force and, more specifically, the requirements for future logistical support. The 1998 edition of the Army Science and Technology Master Plan provided top-down guidance from the Assistant Secretary of the Army for Research, Development, and Acquisition and devoted an entire section to the “Revolution in Military Logistics.” The annex described a number of prerequisites for transforming military logistics, including a distribution-based sustainment system where logisticians could move materiel directly from depots and suppliers in the United States to units deployed worldwide without creating intermediate stops, stockpiles, or chokepoints; real-time situational understanding, a condition where suppliers and customers throughout the supply chain could track shipments and stock levels at any time and at any point in the system; and a seamless support system that eliminated incompatibilities among the various customers in the supply chain.<sup>108</sup>

In 1999, the Office of Deputy Chief of Staff for Operations and Plans produced an Army Plan for the period between FY 2000 and FY 2015 to provide strategic and mid-term guidance for developing the Army’s Program Objective Memorandum. The Plan established “Sustain the Force” as one of ten mission areas necessary to accomplish the Army’s core competency, the conduct of prompt and sustained operations on land throughout the entire spectrum of military operations.<sup>109</sup>

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In June 1999, GEN Shinseki became Chief of Staff. Shortly after taking over that position, Shinseki appeared before the House Armed Services Committee, where he laid out his vision for the future of the Army. As if setting a mark on the wall, the new Chief made it a point to request that the committee enter his statement into the Congressional Record: "Our goal is to be able to deploy a combat-capable brigade anywhere in the world within 96 hours after the receipt of an order to execute liftoff, a division within 120 hours, and five divisions within 30 days."<sup>110</sup>

In May 2002, GEN Shinseki established the LTTF, giving it a mandate to develop a comprehensive set of recommendations to improve logistics processes. Operating under the leadership of GEN Kern, with co-chairs MG N. Ross Thompson, III, Commander, TACOM, and BG Jeanette K. Edmunds, Director of Sustainment, Office of the DA DCSLOG/G-4, the task force studied a range of issues including enabling technologies, financial reform, national industrial base, and power projection architecture, as well as end-to-end distribution and life-cycle management. Over the summer, the task force developed 81 decision papers with proposed process improvements and enablers, which were briefed to and approved by the CSA in August 2002. A Transformation Executive Office in the DA G-4 has the lead for guiding and overseeing the implementation and synchronization of the initiatives.<sup>111</sup>

**Three Major Initiatives.** AMC and the Army had been working for sometime to radically change logistics and financial processes. In 1999, GEN John G. Coburn, now Commanding General, AMC, wrote, "Logistics is the bridge between the Soldier in the foxhole and the factory and the industrial base that produces weapons and hardware for the Soldier. To expedite delivery of materiel and services to the Soldier, AMC is working to revolutionize the flow of information involved in logistics." He then noted three major initiatives underway: the Wholesale Logistics Modernization Program (WLMP), Single Stock Fund (SSF), and Integrated Sustainment Maintenance (ISM).<sup>112</sup>

These programs formed part of the Global Combat Support System-Army (GCSS-A), which will provide a seamless tool for Army, Joint, and Allied combat service operations. This initiative initially involved a three-tier strategy: retail logistics modernization; wholesale and retail logistics integration, including WLMP; and Joint Interoperability to provide the capability for feeding logistics information into the Combat Service Support

Control System (CSSCS). This would give commanders up-to-date, real-time logistics situational awareness.

The Single Stock Fund, a DA initiative to improve processes in the Army Working Capital Fund (AWCF) Supply Management Army (SMA) business area, represented one of the most sweeping changes to logistics and logistics processes in a quarter century. Previously, AMC managed the commodity-oriented wholesale level while the Major Army Commands (MACOMs) managed the retail level at Army posts and installations. The SSF merges the wholesale and retail elements of AWCF-SMA below DA level into a single, nationally managed fund. At end state, SSF will consolidate the management of current wholesale, theater, corps, installation, and division repair parts inventories into a seamless logistics and financial system.<sup>113</sup>

**Army Working Capital Fund (AWCF).** The AWCF) provides money for support costs for secondary items. An element of the Defense Working Capital Fund, AWCF was established by the Office of the Secretary of Defense (OSD) beginning in fiscal year 1997 and provides materiel and support services that are essential to the success of the operating forces. It is a revolving fund, with Army and other DoD customers paying for services and providing the capital to replenish the fund AMC manages AWCF through three activity groups –

**Supply Management, Army (SMA).** This activity group operates on a buyer-seller relationship basis, buying from industry and maintaining through depot- and General Support-level maintenance assigned stocks for sale to customers – primarily Army operating units. Until implementation of Single Stock Fund (SSF), the SMA activity consisted of a wholesale division (AMC) and retail divisions operated at MACOM or installation level. Under SSF, the two levels have been merged into one national fund.

**Depot Maintenance.** The Depot Maintenance activity group gives the Army the capability to repair, overhaul, restore, and improve reliability and maintainability, and upgrade weapon systems and equipment; to store and distribute ammunition, war reserve materiel, and other selected items; and to provide tenant support to other AMC, Army, and DoD activities. The Depot Maintenance Group both competes with and partners with private industry to deliver goods and services efficiently and effectively.

**Ordnance.** The Ordnance activity group produces convention munitions, manufactures large-caliber weapon system components, and provides stockpile management. The group's activities are managed by JMC, a major subordinate command of the AMC. JMC serves all branches of the DoD, providing the industrial capability for the manufacture, renovation, and demilitarizing of materiel – specifically of howitzers, gun tubes, mounts, mortars, grenades and smoke rounds, gas masks, and tool sets and kits.<sup>a</sup>

In November 1997, the Vice Chief of Staff approved a campaign plan for SSF, and in January 1998, the DA DCSLOG organized a Program Management Office (PMO) to oversee implementation. Milestones 1 and 2 were completed in April 2001, with worldwide transfer of inventories at the installation level from retail stock funded accounts managed by field MACOMs to the national revolving account managed by AMC. The implementation at Fort Hood (July 2002) was a success, and the schedule was shrunk.<sup>114</sup>

GEN Kern described an interesting shift of opinion. Initially, as the program began to take over division authorized stockage lists, there was a lot of push back throughout the Army. Once the PMO was established and demonstrations progressed and people in the field realized they would have input, momentum built up. As the time approached to decide on the implementation schedule, field commanders pushed to accelerate the milestones.<sup>115</sup>

With the buildup of forces in Southwest Asia and the threat of imminent conflict, it was decided to ensure that the entire Army would be on the same SSF/Standard Army Retail Supply System baseline, thus giving the combatant commander the maximum logistics architecture flexibility. All units with anticipated roles in the conflict were converted to SSF Milestone 3 by the end of February 2003. The entire Army was converted and capitalized under SSF by May 2003.<sup>116</sup>

The WLMP, later just LMP, was an Army initiative to update and modernize data base management systems and processes dating to the 1970s, the Commodity Command Standard System, which was used to manage

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<sup>a</sup> *How the Army Runs* (2006), pp. 283-284

wholesale inventory, and the Standard Depot System, which was used to manage depot and arsenal operations. Both systems were outdated applications, written in Common Business Oriented Language (COBOL) and dependent on mainframe/megacenter batch processing.<sup>117</sup>

A request for proposal was released in April 1999. In an innovative acquisition strategy, the Army decided to purchase a service, rather than a system. Thus, LMP utilizes commercial-off-the-shelf (COTS) products, rather than government-developed unique code. This should enable the Army to move with the market and adopt new technology. As one of the initial planners explained, “We didn’t want to worry about obsolescence every couple of years.”<sup>118</sup>

In December 1999, a 10-year, \$680 million contract was awarded to Computer Sciences Corporation (CSC). In July 2000, CSC assumed responsibility for the legacy systems LMP would replace, performing software design and maintenance functions previously performed by the Army’s Logistics Systems Support Center (St. Louis, MO) and Industrial Logistics Support Center (Chambersburg, PA). CSC selected SAP to be the provider of Enterprise Resource Planning solutions. SAP, headquartered in Walldorf, Germany, is the world’s largest business software company.<sup>119</sup>

During 2002, system integration testing and process trials were conducted for the first deployment sites, CECOM, AMC-related Defense Finance and Accounting Service activities, Tobyhanna, SBCCOM-Philadelphia, and Headquarters, AMC. GEN Kern approved “live” deployment to these sites effective July 7, 2003.<sup>120</sup>

The system went “live” in July with 4,000 users at five locations. When the CECOM SWA part of LMP went “live,” the first requisition processed was from Camp New Jersey, Kuwait. That first day, the system processed more than 200,000 transactions in a 10-hour period.<sup>121</sup> From July 2003 to February 2005, the system handled 40 million transactions.<sup>122</sup> As of June 2004, the LMP system received a full accreditation from the CECOM commander acting as the Designated Approval Authority. As such, the LMP was fully compliant with all Army requirements as stated in the Defense Information Technology Security Certification and Accreditation Process and the DoD 8500.2 series.<sup>123</sup>

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By early 2003, SSF and LMP were melded together and moving hand in hand, and Ms. Sue L. Baker, the AMC Principal Deputy G-3, had been designated the lead for DA Enterprise Integration to head the effort for synchronizing the Army Enterprise with the Joint Enterprise. As Ms. Baker explained, “We, AMC, had been given the charge by the Secretary of the Army and the Chief of Staff of the Army to deliver seamless logistics business processes and seamless automation from factory to foxhole.”<sup>124</sup>

Integrated Sustainment Maintenance, closely associated with SSF, centralized the management of sustainment maintenance operations, to include maintenance performed at the general support and depot levels. By the end of FY 1998, AMC had established Local Sustainment Maintenance Management offices throughout FORSCOM, TRADOC, and the U.S. Army Reserve (USAR). By 1999, worldwide implementation of ISM had been completed, and transition to the National Maintenance Program (NMP) was well underway.<sup>125</sup>

In 1997, when the Vice approved the SSF Campaign Plan, he gave AMC the mission to integrate NMP in SSF Milestone One, and AMC organized a National Program Office to implement the two programs. NMP established uniform criteria throughout the Army for when and how maintenance should be conducted. Under central management, the Army could minimize repair costs across the entire system. Under the NMP, when a vehicle or piece of equipment came in for repair, mechanics would determine everything that needed to be replaced so that the item could be restored to a predetermined level of miles or hours of expected service. The program also sought to minimize the amount of time a piece of equipment could be out of service due to required maintenance. NMP policy is now documented in AR 750-1, September 5, 2006.<sup>126</sup>

**Task Force Logistics.** Then, in January 2004, GEN Peter J. Schoomaker, the new Chief of Staff, Army, made Logistics one of his focus areas and convened Task Force Logistics, giving it a charter to review and redesign how the Army sustains a land-component commander. As explained by MG Terry E. Juskowiak, then CG, CASCOM, “The scope of this review extends from CONUS support to support of deployed forces. It includes support to the Army, how the Army provides support to sister components once deployed, and how the Army will contribute to a joint logistics capability.” Juskowiak continued, “We’re looking at how we do logistics from the foxhole back.

When I say back, I mean all the way back to the CONUS national level. What we do in the foxhole is very green, very Army-oriented. But as you go back, it becomes more and more purple; that is, more Joint.”<sup>127</sup>

Task Force Logistics included representatives from across the logistics community – AMC, CASCOM, DLA, and the Marine Corps Combat Development Command, and collaboration included Joint Forces Command and other regional combatant commands. Its goal was to eliminate layers of command and to create a modular logistics support structure that speeds delivery of support to the emerging modular fighting force.

Two major accomplishments of TF Logistics are the joint-capable Theater Sustainment Command (TSC) and the recently activated Army Sustainment Command (ASC). The new TSC will be a modular organization with a standard headquarters and subordinate units tailored to the mission requirements of specific operations. It provides logistics command and control for the combatant commander, while ASC provides the distribution pipeline from the national sustainment base.

## **DLA**

### **Transforming Business.**

*“Business Systems Modernization (BSM) is re-engineering DLA’s internal materiel management processes to best business practices by replacing decades-old software with commercial-off-the shelf solutions. BSM is the engine or heart of the transformation. It delivers an integrated set of software applications running on a single hardware platform that all of the agency’s transformational initiatives will leverage as they are developed and deployed. The tangible benefits BSM brings to the warfighter include: improved materiel availability, reduced customer wait time, reduced cost, and improved data integrity.”<sup>128</sup>*

Significantly, DLA has been pursuing transformation in its business practices, too, seeking many of the same goals and, in one major instance, using the same vendor as AMC.

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DLA's overarching goal in business transformation is to replace its legacy business and systems environments with a new business model and organizational structure supported by COTS-based information technology (IT) that will make DLA a single, fully integrated enterprise with a more robust customer focus. BSM is the cornerstone, the major acquisition program that is modernizing DLA businesses processes. The BSM Program provides an enterprise business system, and by aligning with best commercial practices and using COTS products, BSM will enable DLA to leverage process and technology improvements from the commercial sector continuously.<sup>129</sup>

Starting formally in 1998, DLA conducted a series of analyses of its legacy IT systems, especially the Standard Automated Materiel Management System (SAMMS) and the Defense Integrated Subsistence Management System (DISMS). The two COBOL mainframe systems were more than 25 years old and had become technically obsolete.<sup>130</sup>

Vice Director Rear Admiral Raymond A. Archer, III, pointed out, "We need to improve our business processes to satisfy the customer." He continued, "The relevancy and mission effectiveness of DLA five to 10 years from now depend on our vision, our energy, our boldness, and our willingness to change. BSM is a symbol of our commitment to that change. BSM is a DLA strategy for 21<sup>st</sup> century logistics."<sup>131</sup>

Early in 1999, recognizing the great potential for leveraging commercial market products, DLA moved to organize the initiative by forming a BSM Steering Group. Next it established a BSM Program Management Office to conduct the acquisition. Then it created a BSM Office within the Logistics Operations Directorate to guide and coordinate the re-engineering of business practices.

The system integration contract was awarded to Accenture in August of 2000. The program includes implementation of enterprise resource planning software from SAP America of Washington, DC; advanced planning and scheduling software from Manugistics of Rockville, MD; and Procurement Desktop-Defense from American Management Systems of Fairfax, VA.<sup>132</sup>

DLA implemented the first release of BSM on July 31, 2002, as a "concept demonstration," which included a representative cross-section of the

Agency's product lines.<sup>133</sup> Deployment sites included Defense Supply Centers at Columbus, OH, Philadelphia, PA, and Richmond, VA, as well as the Defense Distribution Center at New Cumberland, PA, the DLA Logistics Information Service at Battle Creek, MI, and DLA Headquarters at Fort Belvoir, VA.



By 2005, DLA could report that items managed in BSM accounted for annual sales of more than \$5 billion. The logistics response time for these items had improved by approximately 16 percent, and the time from receipt of

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requisition to Material Release Order had been reduced from hours to minutes.<sup>134</sup>

DLA plans to invest \$850 million to deploy BSM in full. Once it becomes fully operational, BSM is expected to have about 5,000 users and control and account for about 5 million inventory items valued at about \$12 billion.<sup>135</sup>

Altogether, DLA is investing about \$2.1 billion in 13 interdependent initiatives to transform its people, practices, and systems to better meet the needs of its customers at reduced costs.<sup>136</sup>

As separate but inter-related efforts, Customer Relationship Management (CRM) and Supplier Relationship Management (SRM) naturally complement BSM. DLA cannot successfully modernize tools and processes contained in BSM without the customer and supplier connections in CRM and SRM, respectively. Coordinated and integrated, CRM, BSM, and SRM are intended to tie together the supply chain into a seamless, centrally managed pipeline.

CRM is officially defined as “a customer focused strategy comprised of people, processes, and tools used for setting and meeting mutual expectations that optimize value for both the customer and DLA.”<sup>137</sup> Larry Glasco, director of DLA’s Customer Operations and Readiness Directorate explained, “DLA’s customer relationship management effort flanks BSM on the left-hand side to provide the customer desires. . . . CRM will provide the strategy, tools, and technology needed to better understand the unique requirements of the customer and to adjust product and service attributes accordingly.”<sup>138</sup>

The CRM program brings a more cohesive, systematic, and focused approach to customer interaction and is designed to more accurately predict future military requirements, to define mutually agreed upon levels of support for those requirements, and then to precisely monitor the level of actual performance achieved. A key tool is the Performance Based Agreement (PBA), which DLA negotiates with the customer to describe measurable parameters that delineate just what each party will provide and can expect to be provided in the business relationship. By late 2003, DLA had signed eight PBAs.<sup>139</sup>

SRM provides the supplier face necessary to meet the customers’ requirements and provides customers with accurate, timely information. The

strategy is to build two-way relationships with key suppliers as a way to evaluate and manage supplier capability and to solve problems jointly. It is a critical element in DLA's shift from managing supplies to managing suppliers. While CRM will generate a highly refined definition of requirements, SRM will orchestrate the industrial base to ensure that those requirements are fully met as a reasonable cost.<sup>140</sup>

By building enhanced relationships, SRM will enable DLA to be more responsive to customer needs. These relationships are characterized by high trust, mutual respect, two-way communication, shared risks and rewards, and the ability to deal constructively with differences. As part of the SRM initiative, DLA is forming long-term partnerships known as Strategic Supplier Alliances (SSAs) with large Original Equipment Manufacturers, who require a high level of direct communications and day-to-day relationship management. As of August 2005, DLA had formed SSAs with 27 suppliers.<sup>141</sup>

Distribution Planning and Management System (DPMS) and Global Stock Positioning (GSP) are two distribution initiatives that will support CRM and SRM. DPMS uses a combination of COTS and government-off-the-shelf software to improve the visibility and management of materiel en route to and from DLA and in the Agency's warehouse. Thus, it will facilitate a seamless flow of materiel and associated information from the point of origin to the point of consumption.<sup>142</sup>

GSP is designed to ensure that the right inventory is at the right locations at the right time for the least cost. The goal is to significantly reduce levels of inventory and costs of operation while still maintaining warfighter readiness. One key metric is transportation cost avoidance. By performing accurate and timely demand planning and supply positioning, DLA can ship and receive via surface modes of transportation. Currently, surface mode costs about \$.22 per pound, while air shipment costs about \$2.66. Current transportation cost avoidance totals more than \$281 million.<sup>143</sup>

One outcome of GSP is the focus on Strategic Distribution Platforms, which stock inventory to support customer demands of global breadth. These hub sites are located at New Cumberland, PA, and San Joaquin, CA.<sup>144</sup>

Another element of GSP is the co-located distribution center, which focuses on stocking materiel needed to support the missions of the on-site

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customers. These distribution centers stock materiel that has predictable and frequent demand. As the BSM rollout progresses, customers of co-located distribution centers will see more and more of their items being supplied by the co-located centers.

GSP supports overseas customers by providing forward stock sites tailored to each theater of operations and its deployed forces. DLA currently has two Theater Distribution Platforms, one at Yokosuku, Japan, and one at Germersheim, Germany; and four Forward Distribution Depots, located at Pearl Harbor, Hawaii; Sigonella, Italy; Guam, Marianas; and in Kuwait.<sup>145</sup>

## **AMC**

**Structural Steps.** While straining to support the Soldiers deployed in OEF and OIF, AMC also pressed efforts within the command to restructure organizations and to re-engineer processes in order to be more efficient and effective. The structural transformation started at the top but reached into almost every corner of the command. Early in 2002, Headquarters reorganized from its 30-year old directorate staff into a G Staff, a move intended to mirror the G Staffs of the Army headquarters but also to emphasize the renewed focus on supporting Soldiers.

At the same time, AMC restructured many of the subordinate activities, in the process creating some new organizations that supported Homeland Defense. In October 2002, SBCCOM cased its colors. In its place, AMC stood up three realigned elements: the Research, Development, and Engineering Command (RDECOM), the Chemical Materials Agency (CMA), and the Guardian Brigade.<sup>146</sup>

The ASA(ALT) and the CG, AMC worked jointly to establish an agency to execute chemical demilitarization plant construction, operation, and closure. CMA, which incorporated the former PM for Chemical Demilitarization and portions of SBCCOM into one agency, took on the mission of accounting for, storing, and destroying the nation's arsenal of chemical weapons.<sup>147</sup>

AMC organized the Guardian Brigade to consolidate existing, operationally proven Army assets into a single activity able to provide a

specialized chemical, biological, radiological, nuclear, and enhanced high-yield explosives (CBRNE) response. The unique equipment and specially skilled personnel of the Technical Escort Unit (TEU), established in 1943, served as the core of the brigade's operational capabilities. Brigade components deployed to Washington during the anthrax scare in the fall of 2001 and provided support to the 2002 Super Bowl and the 2002 Winter Olympics.<sup>148</sup>

In 2003, after one year as a provisional organization, the Guardian Brigade moved into FORSCOM, incorporated additional capabilities, and was activated as the 20<sup>th</sup> Support Command CBRNE. TEU became the 22<sup>nd</sup> Chemical Battalion.<sup>149</sup>

RDECOM, provisionally established in October 2002, brings together the Army Research Laboratory (ARL), the Research, Development, and Engineering Centers (RDECs), and other R&D activities in a single entity focused on delivering new technologies from the lab to the Soldier in the field. Mr. David Mills, Executive Deputy to the Commanding General (EDCG), AMC<sup>a</sup> at that time described two goals as “getting cohesiveness across the disciplines of the RDE (Research, Development, and Engineering) structure and to finally overcome the problem of researching and testing forever and never getting it into production.”<sup>150</sup>

While creating RDECOM, with its largely long-term focus, AMC also created a real-time adjunct, the Agile Development Center, to respond to developments on the battlefield and provide solutions quickly. Once RDECOM was stood up, ADC became part of the Systems of Systems Integration (SOSI) activity. During the early stages of OIF, Iraqi forces found a weak spot in the Abrams tank. SOSI reviewed details of the problem and determined a solution that was fielded, thus eliminating a critical vulnerability even as combat continued.<sup>151</sup>

During this same time period, AMC moved to realign the Operations Support Command (OSC), headquartered at Rock Island, IL, partly to improve management of industrial activities and partly to emphasize support forward to deployed warfighters. In January 2003, to make management of ammunition more efficient, AMC stood up the Joint Munitions Command.

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<sup>a</sup> Mr. A. David Mills retired as EDCG, AMC in May 2005 after some 44 years of federal service.

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The command manages the production, storage, issue, and demilitarization of conventional ammunition for all the services.<sup>152</sup>

Significantly, as commander of OSC, MG McManus had already instituted a major improvement in the management of ammunition. The great surge in demand in the days following the attacks of September 11 emphasized the need for up-to-date information regarding the readiness and availability of ammunition. To provide a current status report, McManus instituted the Munitions Readiness Report (MRR) now part of the Strategic Readiness System. The MRR shows readiness, production, quality, and serviceability for each ammunition item and family, and projects readiness for 24 months into the future, a valuable improvement over the old method of reporting that focused on funding and training ammunition rather than actual readiness.<sup>153</sup>

On the other track, AMC moved to consolidate supervision of forward elements and to improve links between theater logistics elements and the nation's industrial base. During 2003, the Army Field Support Command was provisionally stood up as an MSC, with the commander of AFSC overseeing the war reserve mission and exercising the responsibility for the AMC Forwards, the LSEs, LAP management, LOGCAP, and the integration and coordination of AMC readiness and sustainment support directly to the warfighter. In January 2003, AFSC consisted of three LSEs, two CEGs, and nine CEBs located in the United States and in eight overseas nations.<sup>154</sup>

In August 2004, LTG Joseph L. Yakovac, Jr., Military Deputy to the ASA(ALT), and LTG Richard A. Hack<sup>a</sup>, DCG, AMC chartered the Task Force Acquisition, Logistics, and Technology (ALT) to formally bring together AMC and ASA(ALT) force design efforts to create a single node for the combined ALT basket of capabilities.<sup>155</sup>

As part of these efforts to provide timely support at the point of the spear, the brigadier general who commands all deployed AMC Soldiers, civilians, and contractors in the CENTCOM area also serves as the CFLCC C-4<sup>156</sup>. Combining the logistical responsibilities under one commander enables AMC to receive requirements, plan the support from the industrial base, and deploy

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<sup>a</sup> LTG Richard A. Hack served as DCG from October 2002 until September 2005.

its assets to best serve the needs of the theater commander. As GEN Benjamin S. Griffin, CG, AMC<sup>a</sup> commented:

*Commanders in the field need a single person coordinating support from the three distinct communities that make up the national sustaining base: the Acquisition Corps<sup>b</sup>; logistics as represented by AMC and the Defense Logistics Agency (DLA); and the research and development community. Field support brigade commanders provide that capability – the single face to our warfighters.<sup>157</sup>*

To execute missions on the ground and to provide a single AMC face to supported commanders, AMC has established Army Field Support Brigades (FSBs) in seven key locations – Iraq, Kuwait, Europe, Korea, Fort Hood, Fort Lewis, and Fort Bragg. Each brigade is commanded by an AMC colonel who integrates the many capabilities of AMC and its partners in acquisition and contracting to provide unified, responsive support. As COL Xavier P. Lobeto, commander, AFSB-I (Army Field Support Brigade-Iraq) explained:

*Here in Iraq, we've harnessed all AMC's capabilities to serve Soldiers on the battlefield. From installing armor on the vehicle fleet to putting scientists to work on new methods of defeating insurgent tactics, the brigade and battalion are making a direct and positive contribution to the mission . . . We're one team of Soldiers, civilian employees, and contractors dedicated to one mission – supporting maneuver units.<sup>158</sup>*

The concept was also being adopted in the commodity areas. For example, the PEO for Command, Control, and Communications Tactical (C3T) chartered a group of leaders on the ground to facilitate fielding and new equipment training. These “Trail Bosses” were so successful that their

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<sup>a</sup> GEN Benjamin S. Griffin became CG, AMC in October 2004. GEN Griffin had previously served as the DA Deputy Chief of Staff for Plans and Programs/G-8.

<sup>b</sup> The Acquisition Corps oversees the development, acquisition, testing, systems integration, product improvement, and fielding of assigned major programs. Program Executive Officers and Program Managers execute the management function for specific commodity areas. By legislation, the PM reports to the PEO who reports to the Army Acquisition Executive, i.e., the ASA(ALT).

responsibilities were expanded to include all Communications-Electronics (C-E) Life Cycle Management Command (LCMC) platforms. According to MG Michael Mazzucchi, Commander, C-E LCMC, “The mission and objective of the trail boss is to serve as a centralized coordination point for all Team C4ISR<sup>a</sup> (Communications, Command, Control, and Computers Intelligence, Surveillance, and Reconnaissance) fieldings and training actions.”<sup>159</sup>

**LCMC.** These efforts to consolidate support activities reflect similar steps within the larger ALT community to enhance the synergy and effectiveness of Army support organizations by fostering a closer working relationship between AMC’s MSCs and the PEOs. As Assistant Secretary Claude M. Bolton, Jr., the Army Acquisition Executive (AAE) wrote:

*It is imperative that we provide products to the Soldier faster, make good products even better, minimize lifecycle costs, and enhance the synergy and effectiveness of our Army’s AL&T community. To accomplish this, we are integrating significant elements of AL&T leadership responsibility and authority and enabling a closer relationship between the Army Materiel Command’s major subordinate commands and the program executive offices. The life-cycle management initiative that is currently being institutionalized is designed to provide an integrated, holistic approach to product development and system support.*<sup>160</sup>

In January 2003, the Assistant Secretary issued interim guidance that PEOs and PMs should consider organic maintenance depots when planning the acquisition strategy for major weapon systems. The memo outlined the importance of balancing organic and commercial sources in a way that would minimize Total Ownership Cost.<sup>161</sup>

MG James H. Pillsbury provided some background in an article in *Army Logistician*. Since its creation in 1962, AMC has undergone numerous reorganizations, with many changes addressing the question of how best to manage the command’s two major functional areas — materiel development and materiel readiness (or sustainment). The structure has tended to alternate

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<sup>a</sup> CECOM, PEO C3T, PEO Intelligence Electronic Warfare and Surveillance (IEW&S), PEO Enterprise Information Systems (EIS), and C-E Research, Development, and Engineering Center (CERDEC) form the C4ISR Team.

between periods when the two functions were merged into MSCs largely organized along commodity lines (aviation and missile, tank-automotive, etc.) and periods when the two functions were separated. The latter arrangement was most clearly evident from 1976 to 1984, when AMC was known as the Army Materiel Development and Readiness Command (DARCOM) and organized into parallel commodity MSCs, one for research and development and one for materiel readiness for each commodity area. By 1984, the parallel commands had been reunited into single commodity MSCs, and AMC reassumed its original name.<sup>162</sup>

Then, in 1987, the materiel development and acquisition functions were largely removed from AMC to a new structure of PEOs and PMs reporting to a new position outside of AMC – the AAE. This change, to some degree, reinstated the DARCOM division between materiel development and acquisition functions and sustainment functions.

MG Pillsbury wrote that the missions remained divided, the ASA(ALT) with development and acquisition and AMC with sustainment. The vision of the life-cycle management command is to unite those mission areas by creating single commands with responsibility for all three areas (technology, acquisition, and sustainment).<sup>163</sup>

The LCMC concept was directed through an August 2, 2004 Memorandum of Agreement (MOA) between Mr. Bolton and GEN Kern. The intent of the LCMC concept is to integrate AMC MSCs and their associated PEOs under a single commander who will be the focal point and have primary responsibility for the entire life cycle of all systems assigned to the LCMC.<sup>164</sup>

Splitting acquisition and sustainment responsibilities into separate chains has not facilitated true life-cycle management. Integration of the PEOs and the AMC MSCs will give the LCMC commander, PEOs, and PMs the tools for full end-to-end – or “cradle to the grave” – management and enhances the Army ability to get better products into the hands of Soldiers faster and more efficiently.<sup>165</sup>

This initiative gives AMC logisticians more direct input into acquisition processes to influence near-term readiness, future modernization, and sustainment. Likewise, PEOs will have closer ties to the sustainment

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community, assuring a smoother flow of better products to the field, while retaining direct links to the AAE, in full compliance with the provisions of the Goldwater-Nichols Department of Defense Reorganization Act of 1986.

So far, four LCMCs have been established – Aviation and Missile LCMC, Communications-Electronics LCMC, and TACOM LCMC. Effective October 1, 2006, with the standup of ASC, Joint Munitions Command once again reports directly to AMC as an MSC. Established as of November 30, 2006, Joint Munitions and Lethality Life Cycle Management Command (JM&L LCMC) aligns the JMC with PEO Ammo and Picatinny RDEC.

This concept was not new to the communications-electronics community. CECOM, PEO C3T, PEO IEW&S (Intelligence, Electronic Warfare, and Surveillance), and PEO Enterprise Information Systems (EIS) had established and maintained a Partnership Charter since 1993. The C-E LCMC stood up on February 2, 2005, with CECOM, PEO C3T, and PEO IEW&S as components.<sup>166</sup>

The TACOM LCMC initially consisted of PEO Ground Combat Systems (GCS), PEO Combat Service and Combat Service Support (CS&CSS), PEO Soldier, the Integrated Logistics Support Center (ILSC), Ground Systems Industrial Enterprise (GSIE), and the Acquisition Center.

**Stryker – Brigade Logistics Support Team (BLST).** In September 2003, the 3<sup>rd</sup> Brigade, 2<sup>nd</sup> Infantry Division, based on Fort Lewis, WA – the Army's first Stryker Brigade – completed its operational evaluation following training events at the National Training Center at Fort Irwin, CA, and the Joint Readiness Training Center, Fort Polk, LA. In November, the brigade deployed to Iraq, the first Stryker Brigade to do so.

Maintaining and sustaining the Stryker posed several issues for logisticians, especially since such support for the vehicle would be provided – at least initially – almost entirely on contract. In June 2003, AMC Forward Stryker at Fort Lewis (now the Army Field Support Brigade Pacific) began assembling AMC's first Brigade Logistics Support Team. This integrated team of 15 to 17 logistics specialists was tailored to provide dedicated direct support to the Stryker Brigade Combat Team by providing a centralized management structure. Now part of the Logistics Assistance Program, this new construct

integrates contractor personnel (both commodity command and PM-managed) and provides a single point of access back to the LCMC structure.

The development of the BLST to support the Stryker Brigade Combat Team reflects the initiative shown by the AMC Forward Stryker, and it accelerates movement in two emerging, inter-dependent areas. It furthers the “one face” concept of providing integrated acquisition, logistics, and technology support, and this is exactly the kind of flexibility needed to support the Army’s new modular force structure.<sup>a</sup>

The Aviation and Missile LCMC was formally activated on June 16, 2005, and comprised all elements of the Aviation and Missile Command, the PEO for Missiles and Space, and the PEO Aviation. MG Pillsbury assumed command of the LCMC, the PEO Aviation added additional duties as LCMC Deputy to the Commander for Aviation Systems, and the PEO Missiles and Space assumed additional duties as the LCMC DCG, Missiles and Space.<sup>167</sup>

Since its formation, the AMCOM LCMC has managed to transform from a concept to an integrated, closely aligned organization with a single commander who has the primary responsibility for the life cycle of all the Army’s aviation and missile weapon systems. A follow-on aspect is the Soldier Focused Life-Cycle Management (SFL) initiative, designed to integrate each of the activities necessary for the support of the weapon system life-cycle into a single team under the day-to-day management of the PM.

The SFL concept is now a joint venture between Program Executive Office/Project Management Office and AMCOM. The PM will have day-to-day control over the decision making processes that affect the weapon system as well as the supporting activities from such AMCOM activities as its Integrated Materiel Management Center (IMMC), Acquisition Center, and Security Assistance Management Directorate, along with the Aviation and Missile Research, Development, and Engineering Center. The pilot program

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<sup>a</sup> 3<sup>rd</sup> Brigade, 2d Infantry Division, “Brigade History: Stryker Brigade Combat Team,” Fort Lewis web site; Gregory L. Alderete, “SIGTRAKS: Tracking Logistics Information,” Army Logistician (January-February 2007), p. 46; and History Office, AFSC, “Structural Steps, OSC to AFSC and AFSBs,” submission for this project, final draft, June 1, 2006.

for this organizational and management concept is the CH-47 Chinook Cargo Helicopter.<sup>168</sup>

**Rejuvenating the Industrial Base.** The operations in Iraq and Afghanistan generated tremendous demand for materiel. To meet requirements for Operational Readiness and Sustainment, AMC pursued modernization of the Defense Industrial Base, using a two pronged strategy. One goal is a robust industrial base consisting of a complementary and synergistic mix of private-sector and government capabilities. Leveraging private-sector capabilities will enable the Army to focus its resources on those manufacturing processes and products unique to the National Security mission. The ancillary goal is to make the organic base so innovative and productive that it is an essential component of future industrial plans and the provider of choice to PMs.

In 2003, GEN Kern summarized the policy in an article in Army AL&T.

*Today, we look at the industrial base as a mix of commercial and government industrial-base capabilities. The Army relies on the commercial industrial base to meet materiel requirements to the maximum extent practicable. But we focus our organic government capabilities to maintain critical industrial technologies and to mitigate risk associated with the lack or potential loss of commercial capabilities. In the future, we are likely to seek even closer relationships between government and private activities. The goal will be to make the most efficient use of scarce investment dollars while also leveraging the best characteristics of public and private-sector capabilities.*<sup>169</sup>

The organic industrial base, consisting of the maintenance depots, manufacturing arsenals, and ammunition facilities had been under stress for some years. During the decade of the 1990s, use of the depot system had declined significantly, due in large part to declining defense budgets, policies that favored outsourcing, and the lack of an effective policy addressing the preservation of a core logistics capability. Systemic problems included weak financial management systems, and legislation made it difficult to manage workload effectively.<sup>170</sup>

In an effort to address such issues, in 1999, under the auspices of Program Budget Decision (PBD) 407, the Army commissioned the RAND Arroyo Center to study the utilization, efficiencies, and potential consolidation of the government-owned ordnance manufacturing activities (arsenals and ammunition plants). In December 2001, the Department of the Army G-8 combined the PBD 407 study with the Industrial Base Program Review, also on-going. In October 2002, RAND submitted its final report in which it proposed forming public-private partnerships to encourage corporations to invest in Army facilities, using Army venture capital to encourage private industry to develop innovative technologies, and spinning off manufacturing arsenals and depots into Federal Government Corporations.<sup>171</sup>

These proposals caught the attention of the Secretary of the Army, Thomas E. White, Jr., but AMC proposed instead to conduct Business Case Analyses for the ammunition facilities. JMC and the PEO for Ammunition, along with the Industry Committee of Ammunition Producers, collaborated on these analyses.<sup>172</sup>

In February 2003, the Secretary issued a White Paper in which he laid out strategies for transformation of the Defense Industrial Base. Regarding the ammunition facilities, he approved AMC's plan to "right size" the capability by integrating and consolidating, divesting, or leasing, as appropriate. Regarding the manufacturing arsenals, he approved their integration into the new GSIE. And regarding the maintenance depots, he approved an approach calling for expanded partnerships with the private sector, along with implementing Lean initiatives to improve efficiencies.<sup>173</sup>

The GSIE was the brainchild of MG Thompson, Commander of TACOM, and MG McManus, Commander of OSC. It began operating informally in 2002, consolidating the operations of several maintenance depots and manufacturing arsenals into one business enterprise in TACOM. Installations under GSIE included Anniston Army Depot, Red River Army Depot, Rock Island Arsenal, Sierra Army Depot, Watervliet Arsenal, and TACOM Joint Systems Manufacturing Center. Central goals included operating like a business to the maximum extent possible, forging government and industry partnerships, and adopting best business practices.<sup>174</sup>

Having highly skilled and flexible government work forces and facilities enabled the activities to escalate to a heightened level of support. MG James

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Monroe, a previous Commander of OSC, called the depot core capability “an insurance policy.” During a crisis, private industry is under no obligation to perform unanticipated missions. Then too, one cannot surge a cold or even a faintly warm industrial base. The ability to respond quickly and decisively showed the value of retaining that insurance policy to ensure that expertise and equipment is available when needed.<sup>175</sup>

For example, the M-2 machine gun went out of production in the 1970s, and by the early 1990s, the capability to manufacture the gun barrel had largely disappeared. However, the Army identified a requirement to provide 8,000 M-2s in 2005. The Army had maintained an inventory of 13,000 “unserviceable” guns that required some level of repair. Anniston quickly expanded its small existing repair capability to start processing as many M-2s as possible without new parts. During the summer of 2004, the depot started at a rate of 100 per month, with plans to surge production once new barrels and other parts became available from the private sector.<sup>176</sup>

The GSIE gave the Army a powerful capability to produce the up-armor kits and to conduct the maintenance to Reset the force. It is anticipated that the Army depots will need to sustain a wartime work tempo for up to two years after actual Army operations in Iraq stabilize at a low level.

In 2006, GSIE was transformed into the TACOM LCMC Industrial Base Operations Directorate, merging GSIE with the industrial base functions of the Acquisition Center and the ILSC into a single entity.

A key element in the success of GSIE and other industrial elements has been increased partnering with the private sector. Establishing such partnerships helps the Army in two dynamic ways, by exercising facilities and skills required for core depot maintenance capability and by allocating fixed overhead costs over a larger base, thus lowering total Army costs.

The maintenance depots gained considerable flexibility and encouragement to engage in partnering under Title 10, Section 2474, Centers of Industrial and Technical Excellence (1997). Under the statute, the Secretary of the Army designates each depot as a Center of Industrial and Technical Excellence (CITE) in its recognized core competency. As a designated CITE, each depot is encouraged to re-engineer processes, to adopt best business practices, and to enter into public-private cooperative

arrangements. Under these public-private partnership agreements, employees of the partners perform work related to core competencies, including depot-level maintenance and repair, and the private partner may use facilities or equipment not fully utilized by the Army.<sup>177</sup>

The Cooperative Activities Pilot Program (10 U.S.S.C. 4544, 2005)

**Current CITEs (2006)**

**Anniston Army Depot** – Combat Vehicles (Wheeled and Track) (except Bradley) including Assault Bridging, Artillery and Small Caliber Weapons.

**Corpus Christi Army Depot** – Aviation structural airframes and blades, advanced composite technologies, flight controls & control surfaces, aviation engines, transmissions and hydraulic systems including sub-system accessory components, armament, electronics, and support equipment (less avionics).

**Letterkenny Army Depot** – Air Defense and Tactical Missile Ground Support Equipment (less Missile Guidance and Control) and Mobile Electric Power Generation Equipment.

**Red River Army Depot** – Tactical Wheeled Vehicles, Small Emplacement Excavator, Bradley Fighting Vehicle Series, Multiple Launch Rocket System chassis, Patriot Missile Re-certifications, and for Rubber products necessary for sustainment and support to the United States and Allied forces and Agencies.

**Sierra Army Depot** - Reverse Osmosis Water Purification Units (ROWPUs)

**Tobyhanna Army Depot** – Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance (C4ISR), Electronics, Avionics, and Missile Guidance and Control.

**Pine Bluff Arsenal** – Chemical and Biological Defense Equipment.

authorizes Army industrial facilities – manufacturing arsenals, ammunition plants, and maintenance depots – to enter into a variety of contracts or cooperative arrangements with non-Army entities to carry out military or commercial projects. Such cooperation may include direct sale of articles or services to persons outside the Army, subcontracting or work-sharing at an

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Army facility, leasing of facilities and equipment, and submission of joint offers for competitive procurements.<sup>178</sup>

AMC was already working a partnering agreement on the Stryker combat vehicle program. At Anniston, General Dynamics Land Systems (GDLS) leases production facilities from the depot to perform final assembly. In an unusual arrangement, Anniston employees perform selected assembly operations alongside GDLS employees.<sup>179</sup>



**Stryker vehicles accompany Soldiers on Patrol.  
Army photo by SPC Jeffrey Alexander.**

The partnership has completed the first overhaul of a battle-damaged Stryker returned to the depot for repair. Some 16 battle-worn Strykers have been sent to Anniston, and the first refurbished vehicle was rolled out on June 30, 2006. “It looks like a brand-new vehicle,” said Michael Viggato, deputy program manager of the Stryker Brigade Combat Team.<sup>180</sup>

GEN Kern encouraged implementation of Public Private Partnerships (P3), believing that P3 that ensure access to complementary or dual production and maintenance capabilities are an integral element in maintaining and modernizing the industrial base. Therefore, he pushed development of the P3 Tutorial and accompanying Handbook and emphasized sharing P3 efforts with industry and the PM/PEO community through the tutorials and the Advance Planning Briefings for Industry.<sup>181</sup>

In a recent example, in November 2005, Red River Army Depot and BAE Systems opened a production facility for the overhaul of Bradley combat systems. The facility will be the site for the overhaul, remanufacturing, and upgrade of the 25-mm enhanced gun system, turret drives, and transmissions. The work is being done as part of a Public Private Partnership established in August 2004.<sup>182</sup>

The Total Integrated Engine Revitalization program is a long-range support strategy for the Abrams AGT 1500 engine that is being implemented by a TACOM, PM Heavy Brigade Combat Team, Anniston, and Honeywell partnership. Key to this program is a performance-based contract with Honeywell under which the depot provides manpower, facilities, and Lean manufacturing techniques and Honeywell provides engineering support, integrated supply chain management, and material-management savvy.<sup>183</sup>

Partnership with Alliant Techsystems (ATK) led to re-establishment and modernization of a TNT (trinitrotoluene) production line at Radford Army Ammunition Plant (RAAP). After producing more than 595 million pounds of TNT, the Radford facility had been placed in stand-by status in 1986 because of environmental concerns. Then, with the onset of OEF and OIF, the need arose for a new acquisition strategy, since TNT was a critical part of Air Force general purpose bombs, and operations were depleting existing inventories at a higher than expected rate.<sup>184</sup>

Extensive market research confirmed the absence of a viable and cost-effective domestic production capability. In February 2003, a Request for Proposal was released with the primary focus of establishing and operating a flexible bulk manufacturing capability within the National Technical and Industrial Base. In September 2003, ATK was awarded a multi-year contract to produce TNT, and it began to renovate and update the facility at RAAP.<sup>185</sup>

During the facility modernization, ATK reclaimed TNT from 750-lb bombs and purchased TNT from Poland. In September 2005, dignitaries dedicated the new TNT facility at RAAP that will produce 24 tons of TNT and next-generation explosive materials per day. Once up to full production, the line will eliminate the need to buy TNT from potentially unreliable foreign sources.<sup>186</sup>

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GEN Griffin continued the emphasis on the partnership program, issuing a memo to each of his MSC commanders in April 2006 in which he urged them to promote partnership opportunities.<sup>187</sup> In July, the AMC G-7 published its Partnership Program Business Development Plan, outlining policies and goals.<sup>188</sup>

Other legislation enacted in recent years has given the ammunition plants and manufacturing arsenals more flexibility as well as funding to facilitate engaging with the private sector to sell goods and services or to partner with commercial firms.

Congress passed the Armament Retooling and Manufacturing Support (ARMS) Act in 1992 to enable the Army to develop a prototype reuse plan for its ammunition plants. At that time, idle plants were costing the Army millions of dollars annually in maintenance and protection. The ARMS program developed the Facility Use Contracting Initiative, a streamlined program that is attracting private business and industry to locate on installations and make use of existing facilities and infrastructure already in place.<sup>189</sup>

For example, at Milan Army Ammunition Plant, ARMS invested \$4.9 million to support the development of FR Countermeasures, Inc. (FRC), a division of Wallop Defense Systems based in England. FRC plans to use two inactive Load, Assemble, and Pack lines at Milan for the production of a full range of pyrotechnic flares. These flares are widely used throughout the world to protect aircraft from missile attacks. One line will be utilized for the production of proven technology flares, and the other production line will house new technology research and development operations. Employment levels are expected to reach nearly 200 when fully operational. The annual benefit to the Army is \$700,000 to \$1,000,000.<sup>190</sup>

The ARMS program has used \$250 millions in government seed money to finance the development of master plans, user directed improvements, marketing, and program implementation at the 10 participating plants. Private investment at these facilities now exceeds \$250 million in a total of 140 business tenants.<sup>191</sup> In 2002, the ARMS program saved the Army \$48 million by using incentives and innovative acquisition techniques, provided \$461 million in economic impact to local communities, and sustained over 3,400 jobs. In June 2003, the ARMS team was awarded the David Packard

Excellence in Acquisition Award for exceptional efforts in transforming Army ammunition plants.<sup>192</sup>

In fact, ARMS has been so successful that Congress established the Arsenal Support Program Initiative (ASPI) to promote the commercial use of underutilized capacity at arsenal facilities. The Arsenal Business and Technology Partnership at Watervliet Arsenal has aggressively pursued ASPI funding. In 2004, for example, the Arsenal Partnership signed a lease with Solid Sealing Technology, Inc. (SST), a new high tech manufacturer of specialized sealed products that can withstand extreme temperatures and pressures. SST targets the semiconductor, nanotechnology, and telecommunications industries. It has signed a Cooperative Research and Development Agreement with Benet Laboratories (also located on the Arsenal) and will take advantage of other local high tech initiatives underway at Albany NanoTech and Rensselaer Polytechnic Institute. The arrangement with SST brings another set of valuable design and production technologies to the Army.<sup>193</sup>

In 2005, the Partnership received a grant of \$561,000 for the construction of the Watervliet Innovation Center, which will be an incubator to help technology businesses, particularly in the defense, nanotechnology, and homeland security industries, grow.<sup>194</sup>

**Lean Six Sigma.** A major theme running through all these efforts to modernize the industrial base is the desire to improve efficiency and increase production, and the fundamental strategy chosen to accomplish this is Lean Six Sigma. Lean is an older manufacturing philosophy emanating from Toyota business practices which shortens the time between customer order and production build/ship by introducing speed and the elimination of waste. Lean maximizes the work effort of an organization's employees by training and empowering them to continuously improve their processes by adapting to change, increasing efficiencies, and eliminating waste. Six Sigma is focused on statistically controlling processes by introducing precision and accuracy. Six Sigma emerged from work by Motorola in the '80s that trains employees to minimize the variance associated with any process, product, or service. The integration of these two continuous improvement methodologies can change the culture of any organization and produce a robust, adaptive, flexible, and responsive enterprise.<sup>195</sup>

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In June 2002, GEN Kern embarked on a program to implement Lean across the entire command. He had visited Red River Army Depot in the spring of 2002 and received an update from the Depot Commander and First Lieutenant David Myer on a Lean project they had started. Myer, a Reservist and an industrial engineer, had overseen the implementation of Lean on his civilian job. At Red River, Myer started the Lean process with a value stream analysis of the depot rebuild line for the Small Emplacement Excavator that identified huge areas of waste in terms of handling, item flow, parts setup, excess floor space, and other areas.<sup>196</sup>

1LT Myer and the success of his project so impressed GEN Kern that Kern proceeded to read *Lean Thinking* by James P. Womack and Daniel T. Jones and to visit Robbins Air Force Base, which had successfully implemented Lean. Moreover, Kern committed funding to support and promote Lean projects. In the fall of 2002, the Command awarded a contract to Anteon, Inc. (Fairfax, VA) and Simpler, Inc. (Ottumwa, IA) to provide Lean masters or “sensei” to all its subordinate activities in order to facilitate “a cultural change by training and mentoring the AMC work force in Lean thinking with a heavy emphasis on hands-on implementation and on-the job training.”<sup>197</sup>

Tobyhanna Army Depot established a full-time Lean Core Team in June 2002. The depot’s first value stream analyses (VSAs) were done on the Sidewinder (AIM-9) guidance and control section overhaul line and the AN/TRC-170 communication system overhaul line.<sup>198</sup> Anniston began its process optimization initiative in 2002 with its reciprocating engine remanufacturing facility. Lean manufacturing provided a 31 percent improvement in labor efficiency for one engine process. Letterkenny’s first value stream activity addressed the Patriot launcher in October 2002. The objective was to become more efficient and to decrease the amount of labor and materials going into production.<sup>199</sup> About the same time, Letterkenny used Lean manufacturing techniques to modify HMMWVs, creating Ground Mobility Vehicles for Special Forces about to deploy into Northern Iraq.<sup>200</sup> By using Value Engineering, Lean, and Six Sigma, the CEB Northeast Asia, Camp Carroll, Korea, was able to complete overhaul on more than 1,500 items for Army Prepositioned Stocks-4 in less than a quarter of the time it usually takes.<sup>201</sup>

One of the early success stories started at Corpus Christi Army Depot in a partnership with General Electric where GE brought in their Six Sigma process and helped depot employees improve processes for rebuilding the T700 helicopter engine. GEN Kern explained, “We found that we could do it in half the time and that engines were lasting twice as long and that their power output – as opposed to being 90 percent of their rated power – was 103 percent of their rated power.” Lean improvements on the engine process saved the Army \$6.6 million in one year.<sup>202</sup>

Determined to build on the success of Lean, GEN Kern encouraged the use of other process improvement tools used in industry. To that end, in January 2004, he directed the integration of the statistical process control methodology of Six Sigma with Lean Thinking.<sup>203</sup>



**Red River Army Depot was named the DoD depot of the year in 2006 for its HMMWV program. GEN Benjamin S. Griffin, Presentation OSD Maintenance Symposium (25 October 2006).**

Red River Army Depot reported a remarkable increase in productivity on its HMMWV recapitalization production line through implementation of three VSAs. In July 2004, the line was averaging three vehicles weekly, spending over 400 man-hours per vehicle. That month, the Depot Commander engaged a Lean team to meet a goal of 200 vehicles per month by June 2005. The first

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VSA identified 13 team events. Nine team events were deemed critical and were completed by the end of August. As a result, the goal was reached in December 2004. Significantly, the accelerated production ramp-up also forced support groups to conduct Lean Six Sigma events to accelerate their output. By June 2005, the original “suspense,” the line was producing 84 vehicles per week, at an average of 170 man-hours per vehicle.<sup>204</sup>

In recent months, these efforts have received public recognition. In October 2005, Letterkenny received a Shingo Prize for Excellence in Manufacturing. The Public Sector Silver Recipient award was given in recognition of the depot’s Lean applications to the Patriot Missile System.<sup>205</sup> In February 2006, the Armaments Research, Development, and Engineering Center, Picatinny, NJ, received the Gold Award, part of the Army Performance Excellence Award Program. In making the presentation, Secretary of the Army Francis J. Harvey declared that ARDEC is “one of the Army leaders in Lean Six Sigma and serves as a benchmark for other Army organizations to emulate.”<sup>206</sup>

Overall, AMC claims savings in excess of \$200 million in 2006 generated by applying Lean Six Sigma.

In order to build on these accomplishments and to press on in developing a responsive, integrated civil-military capability to support a joint and expeditionary Army, GEN Griffin directed development of a Strategic Plan for the Army Industrial Base. A group comprised of representatives from HQ DA, HQ AMC, LCMCs, MSCs, PEO/PMs, the Defense Contract Management Agency (DCMA), and the Defense Logistics Agency worked the issues. *U.S. Army Industrial Base Strategic Plan, Part I*, addressing the organic (i.e., government-owned) industrial base, was published in September 2005.<sup>207</sup> Part II (April 2006) includes both the organic and the commercial industrial bases.

GEN Griffin laid out three objectives for the strategy: to become more efficient inside the depots and arsenals, to bring in other work to spread the fixed costs, and to reach out to the private sector to make contact with potential partners. As he explained: “The key here is that we develop relationships where ideally we can use our capital equipment and our labor force, not in every case but where possible, and partner inside of our depots and arsenals with the private sector.”<sup>208</sup>

In addition to adoption of best business practices, GEN Griffin also emphasized the need for good planning and improved predictability in support and funding for the industrial base. To be healthy, the arsenals, depots, and ammunition plants must avoid the roller coaster cycle where officials are asking, “Do I keep it open, or do I close it?” As he explained, “What I’m after in the industrial base strategic plan is to ensure over time, not just today and tomorrow, but 5 years from now, 10 years from now, that we’ve got a viable Defense Industrial Base in this country.”<sup>209</sup>



## **Chapter III**

### **Pushing Capabilities Forward**

*Operation Iraqi Freedom was a spectacular logistics achievement. Without question, the overriding reasons for that success were the skills, dedication, and commitment of an integrated logistics team of Soldiers and civilians. These professionals developed innovative solutions to a range of challenges caused by major capability gaps in our logistics processes. These men and women were well trained, committed to mission success, and dedicated to our nation.*

*In general, our logistics systems, procedures, and organizations were not ideally suited to support the rapid combat operations that defined the vast Iraqi battlefield. This modern battlefield is characterized by widely dispersed operations, noncontiguous in nature, connected by lines of communications that are not secure. The pace of operations in this battlefield is rapid, with forces being reorganized as rapidly as the enemy situation changes.*

*I could not be prouder of what they accomplished, and I'm hopeful that all Americans understand the magnitude of what they did and can share my pride.*

**LTG Claude V. Christianson, Deputy Chief of Staff for Logistics, G-4<sup>210</sup>**

In all its endeavors, AMC emphasized the need to put capabilities forward, alongside and supporting the warfighter. Structural reorganization, first into the Army Field Support Command (AFSC) and, then, into the Army Sustainment Command (ASC), reflected the determination to improve services and support up front, in theater. Realignment and re-engineering of the industrial base is intended to provide enhanced sustainment and maintenance at home base and in theater with deployed troops.

As one writer put it, a depot is not just a site but a capability. The geographic home provides a base for the deployment of the capability to the operational theater where it is urgently needed. This trend toward an

“expeditionary” depot is reflected in the number and capacity of support activities operating in Iraq and Afghanistan.<sup>211</sup>

This emphasis on adapting and implementing new organizations and processes is a hallmark of the logistics community in its determination to provide enabling support to the Warfighter as far forward as feasible. To do this, AMC and its partners face a number of challenges. The high operations tempo in the harsh environment generates tremendous stress on all systems, as equipment endures much more wear and tear than anticipated. The harshness of the environment is compounded by changed operating conditions that emerged in 2004, as insurgents made everyone a potential target using such low-technology weapons as Improvised Explosive Devices (IEDs).

AMC and its partners have responded with numerous innovations, using LOGCAP to construct and operate facilities and providing Unmanned Aerial Vehicles (UAVs) to conduct reconnaissance. The effort to supply enhanced armor protection is a major collaborative project involving the Army, other Services, and private industry. Another, if less publicized collaboration involved the establishment of Mobile Training Teams (MTTs) from the U.S. Army CASCOM to address issues relating to Rough Terrain Container Handlers (RTCHs). The cooperative attitude is also evident in steps taken to improve the distribution pipeline, notably the use of “pure” pallets and the establishment of the CENTCOM Deployment and Distribution Operations Center (CDDOC), as well as in various aspects of the Reset process.

Significantly, the logisticians were also able to put capabilities forward in humanitarian relief efforts, both at home after Hurricanes Katrina and Rita and overseas after the South Asian tsunami and the Pakistan earthquake.

### **Forward Repair Activities (FRAs)**

The push forward built on the lessons from Operations Desert Shield/Storm when the U.S. Army Support Group – primarily AMC’s Depot Systems Command employees – had provided Special Repair Activities, which operated throughout the theater, providing various levels of maintenance support. In SWA, the FRAs provide essential expertise and flexible support to the warfighter. At the request of the combatant commander, AMC can tailor services ranging from augmenting organization maintenance to performing select depot tasks.

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When the first contingent of volunteers departed Anniston Army Depot for SWA to help establish the TACOM FRA, the deputy to the Anniston commander painted a pertinent analogy when he compared the depot volunteers to a NASCAR (National Association for Stock Car Auto Racing) driver's pit crew. Neither the driver nor today's Army can long survive, he said, without the dedicated pit crews to keep their vehicles running.<sup>212</sup>

The "pit crews" certainly had enough work to keep them busy, as the equipment endured four to five times more wear and tear than the Army anticipated. The Abrams tanks, which normally accumulate about 800 miles a year, are averaging 3,600 in the heat and dust of Iraq. The Bradley, designed to run about 800 miles a year, is running about 3,600, escorting water and food convoys. HMMWVs, accustomed to about 2,600 miles a year, are doing about 7,400.<sup>213</sup>

AMC initiated depot support on the Arabian Peninsula by establishing the Tobyhanna FRA at Camp As Saliyah (or Sayliyah) in June 2002. This activity established a forward presence of expert technicians who could either rapidly fix broken equipment (primarily communications and radar sets), or identify the problem and report it to the depot for expedited supply or maintenance action. The success of this activity, coming after the successful deployment of LARs and other AMC augmentees to Afghanistan, became a model for expanded AMC support to the theater.

In the late summer of 2002, nine FRA elements were approved and scheduled for deployment to Camp Arifjan to support OIF. To support aviation repair, one of the four U.S. Army National Guard's Aviation Classification and Repair Activity Depot (AVCRAD) units was approved to deploy. To support tactical and wheeled vehicle repair, the Team Armor Partnership and TACOM FRA were planned for deployment. Six FRAs were planned for deployment in support of communications and electronics. During the period January through April 2003, personnel for these FRAs processed through the CONUS Replacement Center (CRC), and the nine FRAs deployed and set up in Kuwait.<sup>214</sup>

CECOM deployed two Electronic Sustainment Support Centers consisting of 65 logistics and maintenance personnel. Both centers became operational at Camp Arifjan on March 1, 2003, providing a robust regional support

capability for CECOM and PEO systems. Following the end of major combat operations, a Tobyhanna FRA and an IEW Regional Support Center were established in Afghanistan in support of OEF. In Iraq, CECOM now operates FRAs at Anaconda, Baghdad, and Tikrit, in addition to the one at Camp Arifjan.<sup>215</sup>



**A Soldier from the 1107<sup>th</sup> Aviation Classification Repair Activity Depot works on a chaff dispenser in Balad, Iraq. U. S. Army photo by LTC Virginia Ezell.**

AMCOM's review of the logistical support provided to Army aviation during ODS and their experience with forward positioning of materiel in Afghanistan convinced Team Redstone management officials that plans had to be made for in-country maintenance, repair, and retrograde of helicopters. The command had "started leaning forward" as early as September 2002 when AMCOM management officials began discussions about how to support an AVCRAD in theater, to put a "contractor over there" to support the mast mounted sight on the Kiowa Warrior, and the need for a FRA.<sup>216</sup>

AMCOM also began sending readiness assistance teams to different posts; assessing the then current asset posture in terms of units' assigned stockage levels; and determining what spare and repair parts were in stock and what would be needed in the immediate future. The Integrated Materiel Maintenance Center (IMMC) adjusted and expedited the procurement of these critical items and began to flow components and other items needed to maintain the readiness posture of such systems as Patriot, Avenger, and MLRS missiles, as well as Apache, Chinook, and Black Hawk helicopters into storage sites in Kuwait and Qatar even before the combat theater began to mature.<sup>217</sup>

The 1109<sup>th</sup> AVCRAD, Connecticut Army National Guard, provided the deployable organic base for the Aviation and Missile Command FRA at Camp

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Arifjan. Its capability to perform aviation maintenance or limited depot level repair work in theater on unserviceable components reduced the logistic pipeline on critical items, thus putting serviceable assets back on the shelf and quickly putting aircraft back in the air.<sup>218</sup> The end of 2004 saw transfer of responsibility to the 1106<sup>th</sup> AVCRAD, California National Guard, which completed its mission in November 2005 and transferred responsibility to the 1107<sup>th</sup> AVCRAD, Missouri National Guard.<sup>219</sup>

Reach back capability proved tremendously valuable. Marsha R. Lawson, who headed the Patriot parts war room, explained, “The war room had a challenge to make sure that there was not a piece of Patriot equipment that went down during the war [for which] there was not a part on hand in-country to fix that piece of equipment. That was our challenge.”<sup>220</sup>

Perhaps the most unique support provided to the Patriot units deployed during OIF resulted from the decision by COL Tommie E. Newberry, Lower Tier Project Manager, to personally travel to the area of responsibility to resolve some specific Patriot radar maintenance issues negatively affecting the system’s readiness rates in-theater. This presence in-theater allowed PMO personnel to provide a superior level of support that allowed for some very fast upgrades to the weapon system’s software. COL Newberry explained:

*During the conduct of the war, we learned some lessons that had not been uncovered during the operational or developmental testing. We wrote four different patches to the existing software build and sent those over there. The PMO team in Southwest Asia sent the tapes, the Huntsville team would learn something, and send over a software fix. Then the in-theater team disseminated the fix to units in the AOR, which loaded the software patches into their individual systems and continued to fight the war with the patches. These were turned around within the time span of the Patriot shooting war of two weeks. We were able to pull off four different software upgrades within two weeks.<sup>221</sup>*

AMCOM, in partnership with the PEO Aviation, established a Theater Aviation Single Manager (TASM) to be forward positioned in the CENTCOM area of responsibility. This new unit provided integrated management of deployed aviation material and the focal point for both aviation units and

wholesale system managers. The TASM served as an AMCOM Forward Element at Balad, giving “One-Stop-Service” with direct reach-back capability for technical assistance, logistics support, consolidated readiness analysis, FRA management, Class IX retrograde, and distribution management support for Army Aviation Units within the theater.<sup>222</sup>



**A pallet of helicopter blades is loaded on an AMCOM Express flight. U.S. Army photo AMCOM.**

To improve and expedite support to the Soldiers in the Iraqi theater, AMCOM’s IMMC developed the “AMCOM Express,” a dedicated C-17 flown from Corpus Christi, TX, to Balad, Iraq. The dedicated Air Force plane shipped critical, high-priority items and returned to Corpus Christi battle-damaged aircraft and material. By July 2005, AMCOM Express had shipped more than 272,000 pounds of

critical, high-priority items and had returned to Corpus Christi with more than 208,000 pounds of battle-damaged aircraft and material since its first flight in October 2004.<sup>223</sup>

The TACOM FRA at Camp Arifjan provides support to wheeled, tracked, material handling equipment (MHE), and other support equipment. At LSA Anaconda, TACOM established a HMMWV Support Center, a Heavy Tactical Vehicle Service Center, and a Small Arms Support Center (SASC). TACOM also procured and fielded six Mobile Tire Service Centers to support wheel assembly repair and improve Soldier safety in Kuwait, Iraq, and Afghanistan. They continued to provide a Team Armor Partnership in Iraq to support modernized combat equipment.<sup>224</sup>

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Army Field Support Battalion – Afghanistan, located at Bagram, has the only Add-on-Armor facility in Bagram and the only General Support maintenance facility in Afghanistan.<sup>225</sup>



**Bagram, home of AMC AFSBN-AF. AFSBN-AF, "Monthly Significant Accomplishments," April 2006.**

The TACOM FRA, Camp Arifjan, is a fixed repair facility that became operational in March 2003 and was staffed primarily with personnel from Anniston and Red River Army Depots. During the course of operations, personnel from other Army depots and arsenals have supplemented the workforce. The FRA is involved with the full range of support, from Direct Support (DS) through depot work; however, its primary mission is the repair and return to stock of Class IX items. To supplement the repair capability of the FRA, TACOM LCMC also deployed the Mobile Parts Hospital (MPH) Rapid Manufacturing System (RMS) to manufacture parts not readily available in the supply system.<sup>226</sup>

**Mobile Parts Hospital.** A small air conditioned shop housed in a converted shipping container, the MPH is operated for AMC by contract workers from Alion Science (Detroit, MI) and Focus: HOPE (a Detroit non-profit). It consists of three individual modules that support fabrication of standard and customized parts for vehicles or systems. The RMS is a C-130 transportable, mobile manufacturing center composed of two International Organization for Standardization containers, the Lathe Manufacturing Module, and the Rapid Manufacturing Module. The Communications and Control Center stores the data base, which houses the technical data, along with the communications links to data bases, maintainers, engineers, and Soldiers around the world. The Agile Manufacturing Cell provides reach-back support. Located in Detroit, it includes a multiple manufacturing system, reverse engineering, and finishing capabilities. The unit produces specific parts that the RMS unit cannot fabricate because of size, weight, or environmental restraints. The Army Strategic Planning Board provided \$4.2 million to cover operations in theater for the first MPH, which was deployed to Kuwait in October 2003. Additional units were put into Iraq and Afghanistan in 2005.<sup>a</sup>

The Team Armor Partnership (TAP) – Rear, located at Fort Hood, TX, was formed in March 1999. As the war developed, the need for a forward facility became evident, and TAP - Forward received a call forward notice in April 2003. The TAP Team at Rock Island Arsenal quickly developed a plan, identified a team that included GDLS contractors and a military liaison, and deployed the team to Camp Arifjan to set up TAP - Forward operations. As the theatre developed, TAP moved into Iraq to better support the warfighter. The mission of TAP Forward is to provide forward support to deployed units by stocking, storing, issuing, testing, and repairing unique electronic components for the Abrams M1A2, M1A2 Sustainment Enhancement Package, M1A1D; Bradley M2A3, Command and Control Vehicle, and Wolverine. The mission was later broadened to include test and repair for all Abrams and Bradley variants in theater.<sup>227</sup>

The Stryker FRA became operational in September 2003. The facility is managed by PEO Ground Combat Systems (GCS) and supported through a

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<sup>a</sup>“Mobile Parts Hospital Makes Critical Parts,” *AMC Command Post* (November 2005); Newman, *General Paul J. Kern*, p. 54; and Ashley John, “Mobile Parts Hospital (MPH) – the ‘Parts Doctor’ Is In,” *Army AL&T* (July-August 2005), pp. 36-39.

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Contractor Logistics Support maintenance agreement with GDLS under a performance based logistics contract. The primary mission is to stock, store, and issue parts directly supporting the operational readiness of the Stryker. Vehicle repairs which exceed the capacity of the deployed units are also repaired at this facility.<sup>228</sup>

In October 2003, the HMMWV Service Center opened its doors at Anaconda. In January 2004, the first Mobile Tire Service Center procured by TACOM was shipped to the HSC at Balad. In early 2004, TACOM LCMC identified a need for a centralized repair facility for sustainment of the heavy wheeled vehicle fleet, and a solicitation was issued. The Heavy Wheeled Vehicle Support Center, located on Camp Anaconda, became operational in May 2004. This fixed facility was established under the TACOM LCMC Focus Sustainment contract to DUCOM Inc., and provides unit and direct support level services and repairs.<sup>229</sup>

In late 2004, operations were expanded to include repairing all wheeled vehicles and MHE as well as operating a tire center. The operation was rechristened the Wheeled Vehicle Support Center (WVSC) to recognize its new mission. To supplement the repair capability of the WVSC, TACOM LCMC also deployed an MPH RMS to manufacture parts not readily available in the supply system. In addition to supporting tactical vehicles, the facility also supports MHE, Commercial Construction Equipment, and the Armored Security Vehicle.<sup>230</sup>

The SASC, also located in Camp Anaconda, is part of the AMC Field Support Battalion. This center has provided Standard Army Maintenance System shop capability through DS level to the Soldier in the field since its inception in July 2004. As of January 4, 2006, the SASC had repaired a total of 2,659 weapons, issued 82,938 repair parts, accepted 2,669 turn-ins, and issued 3,060 weapons.<sup>231</sup>

## **LOGCAP**

For Soldiers deployed around the world as part of the GWOT, LOGCAP has provided almost all life support services, as well as distribution, warehouse, supply, fuel, and other services.<sup>232</sup>

During 2002, task orders were awarded to support OEF in Afghanistan, Uzbekistan, the Republic of Georgia, and Djibouti, as well as Kuwait. By the

time the 3<sup>rd</sup> ID rolled across the border in March 2003, LOGCAP was well established in Kuwait, with Halliburton subsidiary Kellogg, Brown, and Root providing life support services at multiple locations. Since October 2002, KBR had been on the ground at Camp Arifjan, constructing a tent city. Then it was tasked to develop similar facilities elsewhere in Kuwait, including the base camps Virginia, Pennsylvania, New York, and Udairi. The facilities sprouted rapidly, and Soldiers began to enjoy hot food, proper sanitation, and air conditioned sleep areas.

One of the unsung units of OIF has been the LOGCAP Support Unit (LSU), which provides the LOGCAP planners in the Continental U.S. and in deployed theaters. The LSU was activated in October in 1998 after experience in Somalia, Haiti, and Bosnia indicated the need for a trained group of military who could assist in the planning process and in the development of Statements of Work.

Since late 2002, more than 120 LSU Soldiers have deployed in support of OEF/OIF. The organization works with supported units in theater, assisting in requirements determination, and acts as an interface between the supported units and KBR and the Defense Contract Management Agency (DCMA).

KBR followed the combat forces into Iraq. As noted earlier, LOGCAP was in Balad/Anaconda since the first moments that LSE-Iraq arrived, providing critical support to V Corps and 3<sup>rd</sup> COSCOM. The requirement to support the Coalition Provisional Authority in Baghdad posed another type of challenge. By the late fall of 2003, the camps in Iraq were essentially established, most consisting of Force Provider or unit tents. However, as the OIF mission took on greater permanence, Soldiers wanted better living quarters, and KBR began to bring in living trailers.

LOGCAP functions in SWA have extended beyond support to U.S. units and the Department of State. LOGCAP also supported the Multinational Division made up of Poles, Danes, Australians, Czechs, Ukrainians, and others. In addition, LOGCAP and KBR have provided assistance to the new Iraqi army training program and to a similar program in Afghanistan. In 2005 alone, KBR produced more than 155 million meals, drove over 41 million miles, and expended almost 67 million man hours. In early 2006, LOGCAP was operating 84 dining facilities, 92 base camps, 3 multinational camps, and 18 ice plants.

And they were doing this while operating in a very hazardous environment. As of January 2006, 65 KBR employees had been killed as a result of hostile action, and more than 240 had been wounded.

### **U.S. Army Ordnance Center and Schools (USAOC&S)**

**Mobile Training Teams and Battle Damage Assessment and Repair.** All partners in the logistics community went forward to support deployed forces. Personnel from the USAOC&S have deployed overseas on a wide variety of training and operational assignments. The majority served in Afghanistan or Iraq, but personnel have also served in Djibouti, Kyrgyzstan, and Tajikistan. For example, USAOC&S sent Mobile Training Teams (MTTs) to train U.S. combat engineers in Afghanistan in advanced skills in identifying and disposing of unexploded ordnance and to assist Iraqis in basic techniques for disposing of unexploded ordnance.<sup>233</sup>

The TRADOC Executive Agency for Battle Damage Assessment and Repair and Recovery (BDAR), generally referred to as the BDAR Office, provides MTTs that have been in demand. One important mission undertaken by the BDAR Office was to devise procedures and equipment for recovering the Stryker Interim Combat Vehicle. The Stryker was fielded without a “lift and tow” capability. Hence, towing a disabled Stryker is a problem in soft sand, as the vehicle tends to “plow” into the sand. The recovery experts in the BDAR Office are developing procedures to use a fifth-wheel towing device to lift up the front end of the vehicle to improve recovery capability.

Moreover, the USAOC&S trainers use their lessons learned to prepare Soldiers for deployment. Thus MTTs have been sent to teach recognition of IEDs to stateside units from the Alabama National Guard, Fort Hood, TX, and Fort Bragg, NC, as part of their preparation for deployment. Teams have also visited the Combat Readiness Centers to assist in incorporating tasks on recognizing and reacting to IEDs into the training scenarios.

The Ordnance Mechanical Maintenance School (OMEMS), a subordinate school of the USAOC&S, has initiated a new two-week course at Redstone Arsenal called the Global Anti-Terrorism and Operational Readiness (GATOR) Course, which provides deploying EOD Soldiers training on the newest equipment, tools, and techniques. The first week of GATOR training

consists of briefings provided by national intelligence agencies, EOD Technical centers, former Counter-Explosive Exploitation Cell staff members, and guest evaluators. Students also receive demonstrations of the latest electronic-countermeasure and robotic equipment. The second week of GATOR training is a series of scenario-driven field exercises.



**A civilian instructor in the OMEMS Wheel and Track Automotive Department teaches a Soldier how to repair fiberglass using materials found in a BDAR kit.  
U.S. Army Photo CASCOM.**

Since 2003, BDAR MTTs have provided predeployment training to 7,000 Soldiers at Forts Richardson and Wainwright, AK; Fort Lewis, WA; Fort Hood; Fort Stewart, GA; and Aberdeen Proving Ground, MD. A crew trained in BDAR techniques and equipped with special BDAR kits can save lives and equipment on the battlefield. With glues, patches, plugs,

and tape, the trained crew can perform expedient repairs to keep a vehicle in operation and enable the crew to survive a tight spot.

**Rough Terrain Container Handler.** Today, the most efficient way to move necessary materials from embarkation to destination is via shipping containers, rather than the quickly fading "break bulk" or loose cargo method. Along with the advent of container shipping, there comes the critical importance of its key enabler, the Rough Terrain Container Handler, commonly known as the RTCH. Since its evolution in 1978, this variation on the Caterpillar wheel loader, with a forklift mast, lifts, moves, stacks, repositions, and transports containers at seaports, cargo transfer sites and forward areas, providing solid and dependable logistics support.

In 2002, the Army began to take delivery of the next generation of the RTCH, the Kalmar RT240, a system that handles containers that weigh up to 53,000

pounds, boasts a four-wheel drive capability, and can drive-on and drive-off a C-17 Globemaster.

This efficiency has made the RTCH a mainstay of Army logistics, which makes it all the more critical that the system's operators remain trained and focused on RTCH operations and maintenance. A failed RTCH can have serious consequences, as became evident in July 2003, when AMC dispatched a RTCH Tiger Team to SWA to investigate and determine the root cause of the low operational readiness rates of the Kalmar RT240 employed in OEF/OIF.

The Tiger Team assessed the problem as having three parts, each basically resulting from insufficient operator training. First, a user disconnect between what the RT240 was designed to do and how it was being employed. This disregard of container yard "doctrine" led to the second finding of the Tiger Team, insufficient operator training. Examples of damage to the RT240 as a direct result of the operator training deficit were catastrophic engine damage due to improperly maintained service parts, structural damage due to lifting loads greater than 53,000 pounds, structural damage due to carrying loads over a distance improperly, and in-cab computer damage due to improper operation and maintenance of the electrical system. The third finding was insufficient parts availability, which led to various degrees of controlled substitution of parts triaged from systems already down for maintenance.

In response, the Transportation School sent mobile training teams (MTTs) in 2003, 2004 and 2005 to provide on-site operator training at a variety of locations in theater. The AMC RTCH Tiger Team noted in their After Action Review (AAR) that the train-the-trainer concept, wherein the trained operator trains his or her replacement, is not necessarily the best way to transfer these skills and knowledge to the next generation, since expertise is lost when the two generations do not sufficiently overlap.

In January 2006, a SWA theater situation report (SITREP) regarding RTCH problems identified cracked booms on the Kalmar RT240 as an operator training deficit. Subsequent to the SITREP and a comprehensive analysis of the on-going RTCH operational readiness issue, the U.S. Army's Combined Arms Support Command embarked on a systemic intervention approach to the RT240 challenge. As a result, the Transportation School introduced an 80-hour RTCH operator training course at its home campus at Fort Eustis, VA,

beginning in June 2006. The course is designed to train identified RTCH operator personnel in preventative maintenance and established operator doctrine prior to their assignment to RTCH operator duties.

While the first course geared up, the Transportation School deployed a MTT to SWA to conduct RTCH operator training during Fiscal Year 2006 to address the immediate situation. This time, as an adjunct to the operator training effort, the MTT also assisted the deployed forces in standing up an on-site RTCH driver academy to sustain the operator training requirement beyond the team's 179-day deployment period.<sup>a</sup>

## Special Projects

This industrial capability of forward support with reach back to the depots, combined with improved management and processes, enabled AMC to address pressing issues quickly. For example, success in producing and fielding add-on armor for the HMMWV provided valuable experience towards producing armored cabs and conversion kits for the M939 5-ton truck and other vehicles. Then, too, electronics experts have produced tools to thwart IEDs, and the ALT team moved aggressively to provide equipment as part of the Rapid Fielding Initiative (RFI).

**Armor Enhancement.** As OIF unfolded and the insurgency grew, the U.S. military found itself on a new type of battlefield in which historically rear-echelon vehicles were exposed to a volatile combat environment. The great majority of HMMWVs conducting peacekeeping patrols and monitoring lines of communications and supply were “light-skinned” and vulnerable to enemy fire and the escalating use of IEDs.

The Army turned to the PM Tactical Vehicles (TV) and its AMC associates to meet the urgent need for additional protection for the Soldiers and their vehicles. The Army Research Laboratory initiated the project in August 2003, designing the Armor Survivability Kit (ASK), which replaced

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<sup>a</sup> Joe Shepard, Chief, Maritime Branch, Training Directorate, U.S. Army Combined Arms Support Command (CASCOM), Fort Lee VA

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the standard doors and windshield with steel doors and ballistic glass while adding additional armor beneath the doors and a plate on the back. Fielding of the ASK began in October 2003 with the first crates sent to Iraq. AMC civilian employees comprised some of the first teams sent to Iraq to install kits and teach Soldiers how to install them.<sup>234</sup>

Following ARL's initial work, Tank-Automotive Research, Development, and Engineering Center (TARDEC) improved the design and fielded some 100 kits to Iraq in November 2003. Then PM TV contracted with GSIE, which was just celebrating its first anniversary when it received a request for 1,000 kits. GSIE Deputy Director Frederick Smith described the activity.

*We brought on Rock Island and Anniston depots because we felt the numbers would grow, and we wanted to get them out as quickly as possible. . . We had barely begun production when we got an additional order for 3,670. That was more than we could produce at those two sites, so we brought on Red River, Sierra, Watervliet, and Letterkenny, which isn't a TACOM unit.*

*. . . We asked for volunteers to go to Iraq and Kuwait to help with the installations and had more volunteers than we could use. . . . Then we got another request for 2,090 in March to be done by the end of June, but the HASC (House Armed Services Committee) wanted them by the end of April, so we brought on Crane (Crane Army Ammunition Activity, also a non-TACOM activity) for a total of seven sites.<sup>235</sup>*

As production integrator, GSIE gave the customer a single point of entry for all production requirements and gave the producers a single point of entry for all production issues. GSIE and its partners went on to provide 12,732 ASKs within 18 months.<sup>236</sup>

In the fall of 2004, midway through production of the HMMWV kits, PM TV again contacted GSIE regarding a new requirement to build 3,000 armored cabs for the M939 truck and 1,200 conversion kits for the older M939 basic version. To make the kits, GSIE, working with the TACOM Acquisition Center, awarded contracts for hundreds of parts, services, and raw materials from more than 150 suppliers in 26 states. To meet the production schedule, GSIE enlisted support from Crane, Letterkenny, and Tooele Army Depot. It

also recruited Navy welders, and the Air Force provided critical machining capability.<sup>237</sup>

Altogether, several systems have had armor added, including the HMMWV, the Family of Medium Tactical Vehicles (FMTV), the Palletized Loading System (PLS), the Heavy Expanded Mobility Tactical Truck (HEMTT), M915 (line-haul truck tractor), M939 5-ton, and the M969 Fuel Tanker. As of November 2003, the requirement was to provide armor protection on 12,000 light, medium, and heavy vehicles. By August 2004, that number had grown to more than 31,000. During 2005, more than 20,000 Level I and Level II kits were installed/fielded.<sup>238</sup> Kits were installed in six countries, involved three other Services, seven U.S. Army agencies, and seven commercial vendors. In SWA, 16 sites installed kits, with more than 650 contractors and U.S. government civilians on the ground turning wrenches. By the end of January 2006, AMC and its partners had completed armoring of the theater requirements for all tactical wheeled vehicles.<sup>239</sup>

**Improvised Explosive Devices.** AMC and its partners also moved quickly in attempting to thwart the IED threat, fielding several countermeasures. A team of engineers, scientists, and Soldiers working at ARL at White Sands Missile Range and New Mexico State University's Physical Science Laboratory conceptualized and fielded IED Countermeasure Equipment (ICE) in less than six months. About the size of a small microwave oven, the ICE uses



**Soldier inspects installation of ICE unit in a USMC Humvee.  
ARNEWS, July 21, 2005.**

commercial and military signal-jamming technology to defeat radio-controlled IEDs ranging from simple fuzes to very sophisticated devices. It was named one of the Army's "Top Ten Greatest Inventions of 2004."<sup>240</sup> The Marine Corps selected ICE because it proved successful in terms of performance and it could be procured and fielded most expeditiously. Initially, the Marines ordered 1,066 ICE systems; then it ordered 2,500 more. Meanwhile, the Army ordered 3,000 systems.<sup>241</sup>

CERDEC modified existing Shortstop Electronic Protection System (SEPS) technology into several variants of an Electronic Countermeasures (ECM) System, fielding nearly a thousand units in a nine-month period. One such device is the Warlock ECM, which detects and detonates IEDs planted along the roadside.<sup>242</sup>

The SEPS is a portable radio frequency proximity fuze countermeasure that causes premature detonation of incoming artillery and mortar rounds. The Warlock devices are modified versions of the SEPS. Warlock Green emits a radio frequency to jam communications signals that detonate IEDs. Warlock Red is a less sophisticated jammer. Warlock devices can be used independently or in groups and come in three configurations, man-pack, vehicle-mounted, and stand-alone.<sup>243</sup>

**Rapid Fielding Initiative.** The roots of the RFI lie in Afghanistan where individual and small unit equipment was found to be inadequate for that region and individuals and units were using their own funds to purchase more suitable gear on the commercial market. In response, in October 2002, GEN John M. Kean, Vice Chief of Staff, Army tasked PEO Soldier to address the emerging requirements. To meet those needs, PEO Soldier launched RFI to speed up the acquisition process and deliver Soldiers the proper equipment they need in their areas of responsibility.<sup>244</sup>

Feedback from Soldiers of the 82<sup>nd</sup> Airborne, 101<sup>st</sup> Air Assault, and 10<sup>th</sup> Mountain Divisions identified several capabilities and led to the first generation of RFI equipment. However, this effort produced varied requirements and a cumbersome equipping process not satisfactory for large-scale distribution.<sup>245</sup>

In a collaborative effort, the TRADOC Soldier as a System Integrated Concepts Team at Fort Benning identified a list of 49 individual and unit

equipment items, and PEO Soldier stood up an RFI operations cell to plan and schedule distribution of a standardized list of items. The first such packages were issued to the 81<sup>st</sup> Enhanced Separate Brigade at Fort Lewis, WA, in December 2003.<sup>246</sup>

As RFI expanded, fielding teams from PEO Soldier deployed to scores of CONUS locations, Alaska, and Hawaii, as well as sites in Europe to give the equipment to the troops and to train them in its use prior to deployment. Later, RFI operations centers were established in Kuwait and Iraq, and issue sites were established at Bagram and Kandahar, Afghanistan, all to conduct concurrent CONUS and theater fieldings.<sup>247</sup> As one of the RFI team members said, “With technology changing so fast and Soldiers rapidly deploying, it is necessary to have a flexible solution to get equipment to the Soldiers.”<sup>248</sup>



**RFI team member fits Soldier with ACH at Forward Operating Base Orgun-E, Afghanistan. Photo by SGT Frank Magni.**

Deliveries skyrocketed. In November 2005, at Fort Bliss, the 500,000<sup>th</sup> Soldier was equipped through the program.<sup>249</sup>



Graphic from Team Soldier web site, [peoSoldier.army.mil](http://peoSoldier.army.mil), accessed July 21, 2006.

The original nine items approved for funding and issue were gloves, socks, desert boots, Advanced Combat Helmet (ACH), cold weather protection (underwear and overalls), combat belt, eye protection, cold weather headgear, and a field water heater. By the end of FY 05, the approved RFI equipment list contained 58 individual and small unit items.<sup>250</sup>

The ACH was fielded to Soldiers in Iraq in 2004. The ACH is lighter and more comfortable than its predecessor but still provides protection against fragmentation and bullets in a balanced and stable configuration.<sup>251</sup> It was designed to work with the Individual Body Armor (IBA) system, and each comes with a night vision mount and helmet cover that is reversible from desert to woodland pattern. It can also be fitted with a communications system.<sup>252</sup>

Another popular piece of equipment is the Modular Lightweight Load Carrying Equipment (MOLLE), a rucksack with removable compartments and components that can be configured to meet different requirements. Under RFI, Soldiers receive accessories geared to their specialty; e.g., rifleman, medic, grenadier.

Production and fielding of the MOLLE started in 2001.<sup>253</sup> Shortly after 9/11, a Marine Expeditionary Unit preparing for deployment to Afghanistan during OEF requested 1,200 of the MOLLE backpack frames. Natick Soldier Center (NSC) rushed the order to the contractor, Down East Inc. in Bridgton, ME. The contractor, with only six employees, ended up asking the local residents for help in preparing the frames. The town responded to the crisis, and 24 residents helped complete the order. The president of Down East Inc. commented, "Most of them didn't want to get paid, but we paid them anyway. It made me think of World War II and Rosie the Riveter. It made me feel good to live in the U.S.A. We couldn't have done it without them."<sup>254</sup>

A joint effort between NSC, TARDEC, ARL, and other organizations and contractors addressed the problem of providing air conditioning to Soldiers in HMMWVs equipped with the new armor survivability kits. With temperatures reaching to 130 degrees in Iraq, there was an immediate need to protect occupants from the extreme temperatures. Part of the solution was to upgrade HMMWVs with air conditioning systems manufactured by Red Dot that pumped cool air through an air vest worn by the Soldiers. To supplement and enhance the performance of this system, Foster Miller, Inc. developed a

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liquid circulating microclimate cooling system that used the air conditioner to chill a fluid. The fluid was then pumped through an umbilical cord into the tube lined Air Warrior Microclimate Cooling Garment worn by the crew under their body armor. In August 2004, the first 20 systems, 10 air vest systems and 10 liquid vest systems, were fielded to Iraq. Since then, over 500 of the liquid cooling vests were sent to Iraq and Kuwait for additional field testing.<sup>255</sup>

NSC developed the Army Combat Uniform (ACU) as a more functional uniform to replace the Battle Dress Uniform and the Desert Camouflage Uniform. The design of the uniform used input from the 101<sup>st</sup> Airborne Division (Air Assault) and the 82<sup>nd</sup> Airborne Division, and NSC was able to shorten the development cycle. The first Stryker Brigade deployed to Iraq wearing a prototype of the new uniform. After making several improvements, the second Stryker Brigade deployed to Iraq with an updated ACU. The ACU used a universal camouflage pattern that met operational requirements for desert, woodland and urban terrain as experienced in Iraq and Afghanistan.<sup>256</sup>

IBA systems are separate from the RFI program, and providing them proved to be a real challenge. IBA consists of two modular components, the outer tactical vest and the Small Arms Protective Inserts (SAPI) or plates. Originally, the SAPI were allocated at one plate per three vests, based on the concept that only combat assault fighters exposed to direct small arms fire would have a pressing need. However, in the environment of Afghanistan and Iraq, Soldiers in all occupational specialties were exposed to conditions where a SAPI plate could save a life.<sup>257</sup>

Unfortunately, insufficient raw materials and difficulty with contractors combined to produce some long weeks in which body armor was unavailable. During this time, some Soldiers asked friends and family to purchase commercially available armor even though most commercial body armor failed to meet Army specifications.<sup>258</sup>

During 2004, the disappointments and failures were rectified. AMC and the DA G-8 (Resources Management) took action to equip every member of CJTF-7 by the end of January 2004. Industry led the effort to increase production in the U.S. industrial base to speed delivery of more than 100,000 sets of IBA to forces in combat in less than five months. In the 18 months

from January 2003 to July 2004, the Army purchased about 300,000 full sets of IBA.<sup>259</sup>

Moreover, NSC has developed upper and lower extremity armor concepts that enable the warfighter to tailor protection levels to meet the threat (fragmentation or small arms fire). The modules under development were designed to interface with the outer tactical vest and increase the area of coverage from the neck down.<sup>260</sup>

## **Continuing Support**

AMC and its partners in the ALT community have provided support across the spectrum from the beginning, whether performing procurement functions, distributing equipment, or developing new tools and systems.

USASAC supported two actions that provided refurbished excess vehicles to the new Afghan army. USASAC also worked closely with CENTCOM and the Defense Security Cooperation Agency to identify and fill requirements to support the Polish Multi-national Division (PMND) in its deployment to Iraq. This involved some 16 contributing countries and 7,800 Soldiers per rotation. Items included clothing and individual equipment, night vision devices, and communications equipment. Subsequently, USASAC helped coordinate funding for add-on-armor kits for PMND vehicles.<sup>261</sup>

In the contracting area, the TACOM Acquisition Center has supported a variety of actions. For example, the Multi-National Security Transition Command-Iraq (MNSTC-I) has the mission of organizing, training, equipping, and mentoring the Iraqi Security Forces, including both the military and the police. In 2003, MNSTC-I faced the daunting task of reconstructing the armed forces of Iraq in an extremely short time. A key part of this effort involved buying a large and diverse amount of materiel. The TACOM Acquisition Center was tasked to perform the role of “integrator.” During May 2004, TACOM-Warren awarded the contract for Battalion Sets I. With additional delivery orders, the ultimate value of the contract climbed to \$258 million. The Battalion Sets II package included materiel for the Afghanistan Armed Forces. TACOM-Warren awarded that second contract in February 2005.<sup>262</sup>

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During this same time period, the TACOM LCMC Acquisition Center was also providing contracting assistance in support of the handover of the Iraqi government.

At the technology/new equipment end of the spectrum, one of the most effective contributions has been the Force XXI Battle Command Brigade and Below (FBCB2), Blue Force Tracking (BFT) developed and fielded by PEO Command, Control, and Communications Tactical. FBCB2-BFT is the satellite-based version of the radio-based FBCB2, Enhanced Position Location and Reporting System (EPLRS). It links satellites, sensors, communications equipment, vehicles, aircraft, and weapons in a digital network to provide a continuous, all-weather battlefield picture in near real time, thereby providing greatly enhanced situational awareness and greatly reduced friendly fire incidents.<sup>263</sup>

As explained by one of the developers, “FBCB2-BFT uses satellite technology to track and display friendly vehicles. . .that appear on a computer screen as blue icons over a topographical map or satellite image of the ground. Users can manually add red (or enemy) icons that show up as enemy on the screen and are simultaneously broadcast to all the other FBCB2 users on the battlefield. Other capabilities include creating, sending, and displaying graphics such as bridges, minefields, obstacles, supply points, and other battlefield hazards. Users can also send messages to each other similar to email on the Internet.”<sup>264</sup>

Research into technological advances to improve situational awareness intensified after the first Gulf War when troops sometimes had difficulty finding their way around on featureless landscapes and there were several incidents of friendly fire. The first systems appeared on the tactical Internet in the mid-1990s, and systems were tested further during operations in the Balkans. In 2002, with operations underway in Afghanistan and war with Iraq looming, the Army set to work installing BFT systems in tanks, HMMWVs, C2 platforms, helicopters, and operations and command centers. Fielding support from Tobyhanna Army Depot, urgent contracts awarded by CECOM, and around-the-clock efforts by industry enabled the PEO C3T team to install more than 1,000 systems on Army, Marine Corps, and United Kingdom military platforms.<sup>265</sup>



**Soldier prepares his BFT before going on patrol. U.S. Army photo.**

FBCB2-BFT provided commanders and units in Afghanistan and Iraq a remarkable capability that greatly enhanced their combat effectiveness, abilities to navigate under limited visibility conditions, to move rapidly over great distances and synchronize their movement, and to communicate both vertically and horizontally over extended distances. Many Soldiers claim that if it were not for FBCB2-BFT, they could not have navigated through the almost-zero visibility conditions caused by dust storms early in the campaign.<sup>266</sup> Other Soldiers have commented on its effectiveness in urban terrain while conducting missions such as the "Thunder Runs" into Baghdad. According to COL Ray Montford, the system's program manager, "For the first time in the U.S. Army's history, FBCB2-BFT allowed commanders to visualize their forces on the ground in near-real time. This occurred, for example, on April 5 and 7, 2003, when the 2<sup>nd</sup> Brigade, 3<sup>rd</sup> ID(M) conducted Thunder Runs into the heart of Baghdad. Senior leaders commanding the fight could see their actual locations on the screen. That was a significant milestone, because it had never been done before."<sup>267</sup>

PEO C3T has shared BFT with other coalition partners. For example, the Danish contingent requested BFT, and installation in Danish combat vehicles began in February 2006.<sup>268</sup>

Currently, Army units are using both variants of the FBCB2 baselines, the BFT and the EPLRS. Prior to the war in Iraq, FBCB2-EPLRS was projected for upgrades in capability and user functionality. Since the onset of OEF/OIF and the development of FBCB2-BFT, the program has drastically expanded, with the TRADOC System Manager XXI leading an effort that expands the fielding plan down to the platoon leader and platoon sergeant levels in virtually every division in the Army. These plans include the BFT, the EPLRS, and a smaller, hand-held version of BFT called the Commander's Digital Assistant.<sup>269</sup>

Efforts are also underway to make the BFT interoperable with the Army's Movement Tracking System (MTS), which tracks the locations of supply and maintenance vehicles, and to integrate BFT data directly into Air Force communications systems such as the Joint Surveillance Target Attack Radar System. Moreover, the Joint Requirements Oversight Council has directed the Army and Marine Corps to merge their battlefield networks and build a single blue force tracking system for ground forces.<sup>270</sup>



**Joint Service  
Lightweight  
Integrated Suit  
(JSLIST) submitted  
by RDECOM.**

AMC was especially active in the area of chemical detection and protection. The M40A1 mask was the standard field mask issued to dismounted Soldiers and was designed to protect against chemical and biological hazards, toxins, and radioactive fallout particles. It was standardized in 1992 by the Edgewood Chemical Biological Center (ECBC), now part of RDECOM, and replaced the earlier M17 protective mask used during Operation Desert Storm. During the initial phase of OIF, AMC shipped 30,000 masks to Iraq. ECBC provided technical, readiness, and fit support to the masks throughout OEF and OIF.<sup>271</sup>

The JSLIST, developed by NSC, was a lightweight protective suit that provided 24-hour protection up to 45 days of wear and six launderings. It consisted of a jacket and trouser and could be worn over the duty uniform. The JSLIST dissipated heat quickly to keep Soldiers cooler. It provided protection against all known or suspected chemical or biological

agents. Production of the JSLIST started in 1997. Two JSLIST overgarments were issued to each Soldier. During the initial phase of OIF, AMC shipped 94,000 sets of JSLIST to Iraq.<sup>272</sup>

The Fox NBC Reconnaissance System was a German-developed six-wheeled armored vehicle loaded with ECBC developed detection, warning, and sampling equipment. It had an over-pressure filtration collective protection system and was fully amphibious. An experimental version of the Fox was used successfully during ODS. The M93A1 version, with the M21 Remote Sensing Chemical Agent Alarm mounted on top, was first fielded in 1998. During the initial phase of OIF, the Fox system played a critical role in investigating potential WMD sites and guarding the advancing forces against a possible surprise chemical or biological attack.<sup>273</sup>

According to the 2003 ECBC Annual Report, “ECBC has emerged as the nation’s resource for receipt, triage, sampling and screening of all uncharacterized samples, or unknowns, coming from military theaters of operation, law enforcement agencies, and intelligence organizations.”<sup>274</sup> ECBC’s Forensic Analytical Center (FAC) was one of the most important facilities for that process. During the early phase of OIF, when items found in



**U.S. Air Force Senior Airman Scott White, with the 447th Expeditionary Civil Engineer Squadron, prepares a Talon robot before sending it to inspect a possible IED. U.S. Air Force photo by Senior Airman Brian Ferguson.**

Iraq needed testing, the military sent them to the FAC located at APG. The Technical Escort Unit (TEU) took custody of the recovered items in Iraq and physically moved them to APG.<sup>275</sup>

AMC and its partners have provided a number of new, high-tech capabilities in

response to special needs. The TALON robot developed by the Armaments Research, Development, and Engineering Center (ARDEC) has become a favorite of Explosive Ordnance Disposal (EOD) troops. The lightweight, man-portable tracked ground vehicles have all-weather, day/night, and

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amphibious capabilities and can navigate almost any terrain. TALONs have been deployed to Afghanistan and Iraq for use in EOD and in reconnaissance of suspicious areas, such as caves.<sup>276</sup>

The robots have been so successful that Marine COL Terry Griffin, manager of the Robotic Systems Joint Project Office has commented, “There was a time just a few years ago when we almost had to beg people to try an unmanned ground vehicle. We don’t have to beg any more.”<sup>277</sup>

Another strategy for providing protection for Soldiers involves the Common Remotely Operated Weapon System (CROWS), a remotely operated weapons mount and optical system installed on top of the vehicle but controlled by a gunner inside the vehicle via a joystick, video display, and computer. As one of the CROWS team explained, “The primary purpose of the CROWS is to get the gunner out of the turret where he is exposed to enemy fire and fragmentation and get him down inside the vehicle for protection.”<sup>278</sup>



**M101 CROWS U.S. Army photo submitted by RDECOM.**

ARDEC supported the development of the M101 CROWS to provide military police units in Iraq with a high-tech armament system that allowed operation from within an upgraded armored HMMWV. The 42<sup>nd</sup> Military Police Brigade in Iraq received prototypes in December 2004. CROWS was approved for urgent materiel release on February 2, 2005, over two months prior to its type classification for low rate production. Other units in Iraq began receiving CROWS in April 2005.<sup>279</sup>

The Lightweight Counter Mortar Radar (LCMR) was originally developed by the Communications-Electronics Research, Development, and Engineering Center for U.S. Army Special Operations Command, which needed a stand-alone man-portable system capable of automatically detecting and locating the

source of hostile mortar fire. The system has been used in Afghanistan and Iraq, and the original LCMR was recognized by the Army as one of the Army's "Top 10 Greatest Inventions" of 2004. So far, the Army has procured and fielded more than 30 LCMRs in support of the GWOT.<sup>280</sup>

The spiral enhancement of the original LCMR is a digitally connected, day/night mortar, cannon, and rocket locating system that provides continuous 360-degree surveillance.<sup>281</sup>

Unmanned Aerial Vehicles supply a number of important capabilities. NSC developed the Raven Small UAV (SUAV) as a small reconnaissance device weighing only about four pounds and having a wingspan of four and a half feet. The system is man-portable and requires only three Soldiers to operate it. It provides a bird's-eye view and has been used in Afghanistan and Iraq.<sup>282</sup>



**SGT Juan Rivera launches a Raven SUAV into the air over Baghdad on December 15, 2005. DoD Photo by PFC William Servinski II (Released).**

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CPT Ryan M. Rooney writes of his unit's experience with the Raven.

*With its own Raven, TF 1-7 has the ability to perform almost immediate, on-demand overflights of areas of concern for highly detailed, real-time intelligence without risking Soldiers' lives, greatly enhancing its situational awareness. The Raven provides a number of capabilities to TF 1-7. Among the most important is the real-time, up-to-date, over-the-horizon view it provides over trouble spots. Though the Task Force is also armed with a host of modern imagery products, they are unmatched by the live, detailed, day or night coverage that the Raven provides. It also allows TF 1-7 to conduct Intelligence, Surveillance, and Reconnaissance of danger zones without committing Soldiers, which also allows the task force to monitor an area with a less obtrusive presence.<sup>283</sup>*

The Shadow Tactical UAV program earned the first ever special achievement award for Performance-Based Logistics in the Global War on Terrorism. The special DoD award was presented to AAI Corporation, prime contractor, and the UAV System Program Office, PEO Aviation. The Shadow provides brigade commanders with tactical-level Reconnaissance,



**Shadow UAV at FOB Warhorse, Baqubah, Iraq. U.S. Army  
photo by SPC James B. Smith, Jr.**

Surveillance, and Target Acquisition, and well as battle damage assessment.<sup>284</sup> Since being deployed to Iraq in early 2003, Shadow systems have flown more

than 50,000 flight hours and more than 12,200 sorties in support of U.S. and Coalition operations.<sup>285</sup>

Sometimes introducing new weapons did pose problems. For example, the High Mobility Artillery Rocket System made its combat debut when three prototype launchers were used during OIF even though it had not yet finished developmental testing or entered production. BG Mark T. Kimmitt, who had served as the Chief of Staff for XVIII Airborne Corps at the time, explained, “We had faith – we knew this thing could fire; we knew it was rugged; we knew it was reliable and desirable. We wanted to get it into the fight.”<sup>286</sup>

However, rushing the system to the battlefield caused an uncertain situation in regards to spare parts. BG (now MG) Jeffrey A. Sorenson, the Tactical Missiles Program Executive Officer during Operation Iraqi Freedom, recalled, “It was a major hurdle to get that system into the war because it was a prototype, not a mature system. . . . [We] only had three of these [to deploy] – only four had been produced. We kept one back as a ‘hangar queen’ to provide spare parts because there were no spare parts for the system other than what could be produced.”<sup>287</sup>

## **Distribution**

As early as July 2003, GEN Kern acknowledged that distribution was a major concern, commenting, “We had a lot of the supplies in theater, but because of the lack of communications with the forward organizations, the ability to structure a distribution plan that got the part to the combatant platform that requisitioned that part was a challenge for us.”<sup>288</sup>

In testimony before the House Armed Services Committee in 2004, LTG Christianson, who had been the CFLCC Director of Logistics, C-4, summed up the lack of visibility that affected all elements. “Army logisticians in Operation Iraqi Freedom could not see all the requirements across the widely dispersed battlefield, and operational forces on the battlefield could not see the support coming their way.”<sup>289</sup>

Mr. David Mills, AMC’s Executive Deputy Commanding General, noted the old Vietnam era joke: “Christmas isn’t coming this year because it’s lost in Long Binh Depot.” Mills went on to say that the whole lesson learned was

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that the theater distribution opening package and the distribution process must be in place early on in the campaign.<sup>290</sup>

The problems in distribution resulted from a number of issues. Operational commanders executed a plan which put logistics and sustainment at risk in order to achieve surprise and speed in the “running start.” DoD curtailed or delayed the arrival in theater of support elements in an effort to “shrink” the logistics footprint. This lack of personnel allowed a significant backlog to build at the Theater Distribution Center and at the Air Port of Debarkation (APOD), making asset visibility and delivery more difficult even after more personnel arrived.<sup>291</sup>

Then, too, plans changed. As one example, planners assumed that units, once into Iraq, could transition to bulk water production. However, after operations commenced, the decision was made to continue relying on bottled water for hydration purposes. This added a significant demand on a system already suffering from a severe shortage of trucks.<sup>292</sup>

Inadequate communications, combined with rapidly moving units, meant that support units spent a lot of time locating and chasing the moving targets. This applied to ammunition resupply after units crossed the border, but to other systems as well. For example, the executive director of the AMCOM IMMC cited the Patriot missile system. Whereas during ODS, most Patriot batteries had remained in fixed sites, during OIF, just about every battery accompanied maneuver units into Iraq. This caused significant challenges in supplying parts and services in a timely manner.<sup>293</sup>

Moreover, as lines extended into and within Iraq, the supply lines themselves became increasingly vulnerable, requiring establishment of armed convoys and development of a new distribution plan for elements in Iraq that depended more on aviation assets.

Then too, once the units received parts and equipment, they had to account for them. This aspect of “visibility” was substantially complicated by the recent and on-going implementation of the Single Stock Fund initiative that merged the retail and wholesale supply systems. A new automated system with too few experienced operators caused a loss of “visibility” for millions of dollars of spare parts.<sup>294</sup>

To meet such difficulties, AMC and its partners pursued several significant initiatives. Advances in electronic tracking systems, particularly in radio frequency identification (RFID) technology, gave logisticians the ability to track shipments from the point of origin to the final destination in theater. LTG William E. Mortensen<sup>a</sup> recalled that, as the CENTCOM J-4, he had a very clear view and could determine where material was. An interrogation network had been established in the AOR, with interrogators at forward operating bases, convoy support centers, and other locations, so Mortensen would know the last interrogation point a shipment had passed.<sup>295</sup>

However, actual implementation was inconsistent. Many of the deploying combat service support units came from Reserve components that either lacked RFID equipment or were not trained to use it. Batteries would go stale. Sometimes an operator put in the header data but not the discrete data. Sometimes, in the pressure of the situation, logisticians simply found the process too cumbersome and ignored it. Mortensen cited the need for better training, and CENTCOM required all units to employ radio frequency emitter tags and interrogators.<sup>296</sup>

LTG Mortensen noted that the RFID system facilitated adoption of another initiative, “pure pallets.” Initially, the cargo boxes and pallets sent from DLA distribution centers in CONUS typically contained material destined for multiple users. CSM Dan Elder, who was the 13<sup>th</sup> COSCOM CSM in Iraq, noted that they pushed the idea, explaining, “What we recognized is the fewer times you have to put your hands on it and touch it, unpack it, and then repackage it, the more likely that you can get it there quicker.”<sup>297</sup>

Mortensen said that CENTCOM worked with DLA and U.S. Transportation Command (TRANSCOM) to load and ship pallets for particular customers in particular geographic locations, e.g., pure pallets for specific Supply Support Activities (SSAs). That way, “when it arrives in Iraq, it can be taken off an airplane with a K-loader, put right on a truck, and delivered to the ultimate SSA without anyone having to touch it again.”<sup>298</sup>

Logisticians were able to provide enhanced logistics situational awareness and execution planning by using the Joint Deployment Logistics Module

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<sup>a</sup> LTG Mortensen became AMC Deputy Commanding General in September 2005.

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(JDLM). A system of systems, JDLM was developed initially for the U.S. Army, Europe, specifically the 21<sup>st</sup> Theater Support Command. As LTG Mortensen noted, the 3<sup>rd</sup> COSCOM took JDLM with it when it deployed to Iraq. What JDLM did was to import information from a variety of logistics data bases and to integrate that data into a display, thus generating a logistics common operating picture (LCOP).<sup>299</sup>

As GEN Kern noted in September 2003, JDLM tied together data feeds from systems such as MTS and the Defense Transportation Reporting and Control System to provide 4<sup>th</sup> ID with a near real-time common operating picture. This enabled the division to improve control of its convoys and to re-route convoys to avoid downed bridges and enemy ambushes.<sup>300</sup>

So JDLM provided management of on-hand assets and planning of convoys, but it was somewhat late arriving in theater, as it became available to CFLCC only with the execution stage of OIF. Then, too, leaders at AMC complained that “LCOP did not work for us here in the States.” As LTG Hack explained, “We could not see where our repair parts were going.”<sup>301</sup>

In an interview with the AMC Lessons Learned Team, BG Michael Lehnert, U.S. Marine Corps, Commander, Marine Logistics Command during the major combat phase of OIF, made recommendations for improvements to communications. Specifically, BG Lehnert mentioned that “not only do logistics leaders need to see the battles to anticipate the next logistics mission, but the combat leaders need to see what the logisticians are doing.” This implies a further step forward from the current practice of providing separate warfighter and logistics communications systems. BG Lehnert explained that, “although satellite communications can be obtained to allow logisticians to communicate, logistics operations need to be in the overall service communications system.”<sup>302</sup>

To solve some of the technical problems and improve data base management, the Army is developing Battle Command Sustainment Support System (BCS3) as part of the Army Battle Command System. BCS3 will merge some aspects of the Combat Service Support Control System with JDLM and in-transit visibility (ITV) to fuse sustainment, ITV, and force level information data to aid commanders in making decisions at all echelons.<sup>303</sup>

The BCS3 development team produced a six-pound commercial-off-the-shelf (COTS) laptop running Microsoft Windows that gives commanders the logistics picture displayed on a map of the battlefield. With other functionalities in the new system, the commander can plan, rehearse, train, and execute on one system.<sup>304</sup>

On the organizational side, one of the major steps taken to solve distribution problems was the establishment of the CENTCOM Deployment and Distribution Operations Center (CDDOC) at Camp Arifjan in January 2004. In discussing the success of the CDDOC, then-MG Robert T. Dail, Director of Operations, J-3, TRANSCOM, stated, “There’s good news, and there’s bad news. The good news is that everyone wants one; the bad news is that everyone wants one.”<sup>305</sup>

As early as June 2003, shortly after the conclusion of major offensive operations, the AMC commander in SWA, BG Boles, requested that AMC work with DLA to establish a distribution center at Camp Arifjan that would be a single storage operation supporting all customers in Kuwait with both DLA- and AMC-managed parts.<sup>306</sup>

Shortfalls included a backlog of cargo pallets and shipping containers at various points along the distribution system; large demurrage charges against the Army by owners of backlogged containers; a discrepancy of \$1.2 billion in material shipped versus material received by unit supply systems; accumulation of excess material without required documentation at the Theater Distribution Center; and duplication of requisitions and circumvention of the supply chain.<sup>307</sup>

To overcome these challenges, the Secretary of Defense designated the Commander, TRANSCOM as the overall supply distribution process manager. This designation became official in September 2003.<sup>308</sup>

LTG Mortensen notes that he had already spoken with then MG Dail, agreeing on the need for “a deployment and distribution ops center that was resident within CENTCOM, under control of CENTCOM, but manned by experts from the national strategic partner level – the Services, TRANSCOM, and DLA.”<sup>309</sup>

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In late 2003, GEN John W. Handy, the Commanding General of TRANSCOM, proposed the creation of a unit that would capture the capability of the various national-level DoD and Service logistics organizations and deploy into the theater of operations. Officials from TRANSCOM, CENTCOM, Joint Forces Command, AMC, DLA, and other military logistics agencies developed the concepts for how this organization would manage the shipping, receiving, and tracking of supplies. GEN Handy then scrutinized the concept with the Joint Staff, which then briefed Defense Secretary Donald H. Rumsfeld, and Service leaders. GEN Handy and GEN Kern then briefed GEN John P. Abizaid, Commander CENTCOM, on the concept and requested permission to deploy this proposed organization in support of CENTCOM operations. GEN Abizaid approved, and the CDDOC was formed on January 2, 2004 and deployed to Kuwait on January 16, 2004 to support OEF/OIF and operations in the Horn of Africa.<sup>310</sup>

The CDDOC focused on synchronizing operations and eliminating the gaps between the strategic and operational levels. Existing systems were merged into a Web-based network, allowing CDDOC personnel to leverage the operational architecture, systems, and equipment used to execute the DoD's strategic logistics mission. Within the first two months of operation, the CDDOC synchronized strategic and intra-theater lift, improved strategic delivery of critical material directly to forward units, reduced operational costs by improving in-transit visibility and total asset visibility, stopped shipment of containers of unneeded class IV containers, and accelerated retrograde of depot-level reparable.<sup>311</sup>

This initiative constituted part of what COL Richard Brooks, DLA Deputy Executive Director for Distribution and Reutilization Policy, called "the transformation effort to change the way combatant commanders manage and monitor movement of forces, equipment, and supplies." Indeed, the CDDOC was so successful that similar organizations were established for U.S. Pacific Command (PACOM) and U.S. Forces-Korea, and CASCOM began to write it into doctrine.<sup>312</sup>

Establishment of the PACOM DDOC proved especially timely, as it enabled PACOM to speed the delivery of drinking water, shelter, food, and medical support after the tsunami struck Southeast Asia on December 26, 2004. As COL Brooks noted, "Within days of the disaster, the USPACOM Director for Logistics asked USTRANSCOM and DLA to implement portions

of the PACOM DDOC organizational template to assist his staff in handling the massive effort.”<sup>313</sup>

**CDDOC.** Army MAJ Ed DeLissio, Defense Supply Center Philadelphia (DSCP) Command and Control Center, was selected to participate in a pilot partnership project with CENTCOM and TRANSCOM. After two weeks of training, he arrived in Kuwait in mid-January 2004 and remained in theater through late May. DeLissio was assigned to the CDDOC, where he and his teammates were responsible for evaluating and implementing better policies and procedures for the handling of strategic and operational logistics issues and their effects on the Defense Transportation System. On the guidance of CENTCOM’s chief logistician, DeLissio tackled the problems associated with construction and barrier materials backlogged in theater due to transportation delays, redundant ordering by the users, and the rotation of troops in and out of Iraq. Shipments of wood, sandbags, and barrier materials destined for customers in Iraq were piling up at the port facility and the theater distribution center, making it increasingly difficult to evaluate future needs.

By creating a system that married an inventory of existing supplies with demands and projections, DeLissio, along with DLA personnel and logisticians from the 3<sup>rd</sup> Army, managed to rationalize the ordering and distribution process with significant dollar savings for the military. “We stopped upward of 1,800 20-foot containers from being shipped,” DeLissio said. “Those materials would have cost our customers \$23 million for supplies that were unnecessary.”<sup>a</sup>

## Automated Logistics Training

Early reports out of Afghanistan indicated that many units were not able to make their automated procedures for ordering repair parts, tracking maintenance statistics, and tracking property accountability work properly. Using the systems dedicated for these purposes, called Standard Army Automated Information Systems (STAMIS), in a deployed environment was more difficult than in improved garrison settings. Too many units, particularly those from the Army Reserve and National Guard, were

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<sup>a</sup> DLA, Submission for this project, “DLA Chapter for ‘From the Lab and the Factory to the Soldier in the Foxhole,’” p. 36.

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demonstrating a training shortfall on these systems, unable to produce enough trained Soldiers to effectively operate their assigned STAMIS. As the center of gravity of the GWOT shifted from Afghanistan to Iraq, the Directorate of Combat Development for Enterprise Systems (DCD-ES) at Fort Lee, VA, decided to proactively address these concerns by standing up an Automated Logistics Assistance Team (ALAT) in Kuwait, whose purpose would be to provide refresher training to Soldiers on their assigned STAMIS before deploying north into Iraq.<sup>314</sup>

The mission of the ALAT was threefold; to provide formal classroom training, to provide what was referred to as "over the shoulder" training, and to operate a 24 hour telephonic help desk. The first ALAT was established and began operations in December 2002 at Camp Arifjan, Kuwait.

The first of the ALAT's missions, to provide formal classroom training, was originally envisioned as providing refresher training to Soldiers from all components. The concept of operations was simple; units en route to Iraq typically first arrive in Kuwait, train and otherwise prepare for a number of weeks at some of the camps in the Kuwaiti desert, then move into Iraq for their rotation. This preparation period in Kuwait would provide an opportunity to bring students into a formal classroom setting, replete with computer workstations, and provide STAMIS training tailored to their individual needs and weaknesses.

Although the ALAT was designed to provide refresher training, many Soldiers needed more than a quick brush-up. Regular Army units generally required only refresher training, but in other units, personnel shortfalls dictated that Soldiers formally trained for other jobs (mechanics, truck drivers, etc.) had to be placed in charge of a STAMIS. These Soldiers required initial, rather than sustainment training, which requires much more time. In order to address this shortfall CASCOM and the PM for Army STAMIS commissioned a second ALAT in Iraq, once that country was liberated by coalition forces. ALAT North stood up at Camp Anaconda in March 2004. A year later, ALAT South opened a second digital classroom located at Camp Buehring, Kuwait.

Once a BCT arrives in Kuwait, typically at Camp Buehring, ALAT South conducts refresher training for Soldiers with some experience on their

assigned system. Once the BCT deploys to Iraq, ALAT North picks them up to provide lengthy initial training to anyone requiring it.

In addition to formal classroom training, the ALATs conduct what they call over-the-shoulder training. A trainer from the ALAT travels to the unit requiring training, wherever it may be in the Middle East, and literally stands behind a Soldier at his computer pointing over his shoulder at his own computer screen to provide on-site instruction and technical assistance. Trainers from ALAT South have traveled to train Soldiers in Kuwait, Iraq, Djibouti, Qatar, Afghanistan, Uzbekistan, and Bahrain.

As of July 2006, two ALATs were operating out of Kuwait and Iraq, providing round the clock STAMIS support to Soldiers throughout the Middle



**Instructors on the initial ALAT team, CFLCC Headquarters, Camp Arifjan, Spring 2003. U.S. Army photo Submitted by CASCOM.**

East. ALAT South alone had trained nearly 5,000 Soldiers in its digital classrooms, visited over 1,000 Soldiers in seven different countries throughout the Middle East to provide training, and answered nearly 2,000 telephonic requests for assistance. In view of the success of the ALATs, CFLCC was exploring the possibility of establishing a third ALAT to be located in Afghanistan.

**Property Book Unit Supply, Enhanced (PBUSE).** PBUSE is a web-based Combat Service Support system for management of property books. Its design incorporates the Standard Property Book System Redesign (SPBS-R)

and the Unit-Level Logistics System-S4 (ULLS-S4). A control system for both garrison and tactical environments, PBUSE offers data access to authorized users and meets the requirements of the Federal Financial Management Improvement Act (FFMIA) as well as Chief Financial Officer (CFO) Act mandates.

In 2000, the Office of the Secretary of Defense issued Defense Reform Initiative Directive (DRID) 54, "Logistics Transformation Plans," mandating the implementation of web-based data environments. Army leaders identified an immediate need for a system to meet the logistics information requirements of increasingly demanding and complex global operations. Personnel from the PM Logistics Information Systems (PM LIS) at Fort Lee initiated a pilot program paralleling the supply and property portion of the Global Combat Support System-Army (Field-Tactical).

The pilot program quickly produced a new software package called PBUSE, which uses a centralized web and data base server located behind the Army Knowledge Online (AKO) firewall in the Strategic and Advanced Computer Center (SACC) at Fort Belvoir. Because PBUSE is web-based, asset visibility is significantly increased across the enterprise since all users are connected to one data base, that is, to one system of record.

Satellite-based communications provide the global data environment required to tie the client computers to the central data base server. The Army DCSLOG/G-4 implemented the "Connect Logisticians" initiative, which increased the number of Very Small Aperture Terminals in Iraq, Afghanistan, and Kuwait by 125 per cent. Thus equipped, Soldiers in the field can place their supply requisitions and receive status reports on their requisitions in near real time.

For the commander, PBUSE provides a real-time view of assets. The system also provides automatic LOGTAADS (Logistics, The Army Authorization Document System) updates and serial number tracking, asset adjustments, lateral transfers, split operations, and basic hand-receipt management, while eliminating Unique Item Tracking (UIT) and the Continuing Balance System-Expanded (CBS-X). Without PBUSE, units have to manually execute property management, to include the request, issue, documentation, and accountability of unit supplies and property.

The Army expedited the fielding of PBUSE to deliver this critical flexibility. All property book officers in Afghanistan, Iraq, and Kuwait have received PBUSE to replace their SPBS-R system. Central to the fielding effort is the ALAT, with both ALAT South at Camp Buehring and ALAT North at Camp Anaconda training users in the system.<sup>a</sup>

## Reset

Among the most crucial challenges facing AMC and its partners are the dual requirements to equip troops for deployment and to repair or replace worn materiel so it can be reissued. It is critical that units maintain their operational readiness and be prepared to deploy when needed, so equipment must be returned to optimal condition after the unit redeploys from a combat or stability operation.



**As part of the acquisition Stryker Reset program, Kenny Duncan, heavy mobile equipment (HME) mechanic, replaces the W405 cable in an Infantry Carrier Vehicle (ICV). U.S. Army Photo Submitted by Anniston Public Affairs Office.**

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<sup>a</sup> Based on submission by CW5 Pablo Brown and CW5 Frank Meeks, Tactical Logistics Enterprise Systems Support Branch, DCD-ES, CASCOM, Fort Lee, VA.

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The Army requested about \$13 billion in its FY 06 Supplemental request for equipment Reset. LTG David Melcher, Deputy Chief of Staff for Force Development/G-8, told a House Armed Services Committee hearing that the Army would need about \$13 billion annually as long as the war continues and for two years after the conflicts end to cover the costs of “resetting its equipment.” Melcher said that the Army has been wearing out equipment at nearly nine times its normal rates due to the harsh environment and high operations tempo.<sup>315</sup>

Reset is a generic term that encompasses a series of actions to restore a unit’s equipment to a desired level of combat capability commensurate with mission requirements and available resources.

**Reconstitution** is performed at the field level to correct equipment faults.

**Reset** is performed at the national level, frequently at Army depots.

**Recapitalization** restores the equipment’s useful life and removes damaged stress.

**Replacement** involves procurement of new equipment to replace battle losses.<sup>316</sup>

Shortly after the end of decisive combat operations on May 1, 2003, the AMC LSE-SWA began to emphasize theater sustainment functions. Key areas included turn-in of redeploying units, issues to replace combat losses, and filling units up to authorized wartime levels. APS turn-in was conducted exclusively at Camp Arifjan, and home station equipment was directed to Camp Doha. This established clearly delineated lines for the preparation and shipment of home station equipment and the segregation of APS equipment for Reset.<sup>317</sup>

AMC activities deployed personnel in support. A C4ISR Reset Team was established in July 2003 to coordinate requirements and provide overall management. Tobyhanna sent a radio team to Camp Arifjan to work with TACOM to assess embedded communications-electronics equipment. The tactical satellite team and the avionics aircraft survivability team spent August at Camp Arifjan identifying assets that could be put to immediate use, helping to repair systems, and sending others back to Tobyhanna.<sup>318</sup>

In September 2003, Tobyhanna joined with Letterkenny and the Raytheon Corporation to recondition Patriot Air Defense Systems. Components from

four battalions of Patriot systems were repaired. During FY 04, Tobyhanna helped Reset six battalions at Fort Bliss, TX, with Tobyhanna employees helping conduct System Integration and Check Out as each battery for each battalion was brought back to operational condition.<sup>319</sup>

Team Redstone placed a high priority on Reset of missiles and aviation. By February 2005, about 700 helicopters that had served at least 30 days in Iraq or Afghanistan had been repaired and returned to pre-deployment conditions. Another 160 were being worked on, and 89 others had yet to be inducted into the program.<sup>320</sup>

**DLA works with Team Redstone to support Reset.** Defense Supply Center Richmond (DSCR) is the lead DLA center for aviation weapon systems and environmental logistics support and is the primary supply source for nearly 930,000 repair parts and operating items. The Army Division of DSCR's Customer Operations Directorate focuses on the Army's top four aviation priorities: aircraft on the ground in the operational theater, the Reset Program, Fort Rucker training installation, and Corpus Christi Army depot.

The Army Aviation Reset Team was established in 2004 to support Army Aviation assets as they return from theater, with the objective of returning systems to pre-deployment condition. The Reset team interacts with the Reset program management offices at the Aviation and Missile LCMC to ensure DSCR is working in concert with its Army counterparts. From its outset, the team faced a daunting task, supporting an unprecedented maintenance program, since Army helicopters deployed in OEF and OIF were undergoing severe wear and tear because of the desert conditions in which they operated. depot.

Reset 1, which began in March 2004, was for 736 aircraft, including the UH60 Black Hawk, AH64D and AH64A Apache, CH47 Chinook, and the OH58 Kiowa Warrior. Ron Jackson, who heads the Army Reset Team at DSCR, said his team was swamped at the end of that first year. "Army Aviation and Missile Command dropped 187,000 requisitions on us at the end of 2004," he said. "We were able to fill all but 29,970 of them."<sup>a</sup>

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<sup>a</sup> DLA submission for this project, "DLA Chapter for 'From the Lab and the Factory to the Soldier in the Foxhole,'" pp. 37-38.

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According to TACOM LCMC leadership, more than 8,200 weapons systems and vehicles were Reset in 2005, including tracked and wheeled vehicles, material handling equipment, towed howitzers, chemical defense equipment, and small arms.<sup>321</sup>

JMC helped establish a theater reclamation facility in Kuwait used to inspect, repack, and reissue ammo. The large quantity of ammunition turned in by troops created the need for a theater ammunition maintenance and inspection facility. This facility, located at Camp Arifjan, began operation in September 2003, working AMCOM missile items. The facility began processing conventional munitions managed by JMC in November 2003. JMC has supported CFLCC by providing personnel, packaging materials, and other supplies to support the ongoing inspection process. This facility has returned over \$80M worth of JMC managed munitions to coalition forces for operational use and training and resupply to the field.<sup>322</sup>

Significantly, AMC viewed Reset as an opportunity to participate with units in training in maintenance procedures as well as an opportunity to enhance equipment capability. For example, while a system is undergoing Reset, TACOM installs the latest safety and technological enhancements.<sup>323</sup>

Certainly Reset is a complicated process, with some work done in theater and some done in CONUS depots, troops deploying into theater and other troops redeploying home, and other units in CONUS and elsewhere needing equipment on which to train or to prepare for future contingencies. Moreover, APS fleets are being re-arranged, and the Army is reorganizing on the basis of modularity, all in the middle of armed conflict of unanticipated and prolonged length in a harsh operating environment. In its new configuration, APS will consist of land-based stocks in Italy, SWA, and Northeast Asia, with afloat stocks organized into three regional flotillas – one in the Mediterranean, one at Diego Garcia, and one at Guam/Saipan. Combat Support, Combat Service Support, and ammunition theater-opening assets will be included in all Army Regional Flotilla (ARF) sites. AMC has begun the process by reconfiguring APS in Korea and Japan and establishing ARF 1 in Guam/Saipan.<sup>324</sup>

The Army has implemented initiatives to keep large amounts of unit equipment in theater after the units redeploy to their home stations for the purpose of rapidly equipping follow-on units, while also adding maintenance capacity in theater above the unit level to sustain major equipment items. For example, the Army has developed a pool of equipment in theater to expedite

the replacement of equipment damaged during operations. Referred to as Theater Sustainment Stocks (TSS), it includes tanks, HMMWVs, Bradleys, and support vehicles. As of January 2006, TSS included an estimated 400 different types of vehicles and other equipment.<sup>325</sup>



**GEN Griffin discusses AMC's engine repair and maintenance support capabilities with Deputy Under Secretary of Defense for Logistics and Materiel Readiness P. Jackson Bell during a visit to Iraq. Photo courtesy of AMC PAO.**

The Army has also instituted a policy of Relief in Place, in which new units arriving in theater deploy to their operations area and work alongside the departing unit for final training and acclimation. To facilitate this process, the Army designated certain major equipment items, such as up-armored HMMWVs, add-on-armor vehicles, select communications and intelligence materiel, and

other critical items such as IBA and counter-IED devices, as Theater Provided Equipment (TPE). The TPE initiative began in late 2003, when the first units were directed to leave equipment in theater, then known as “stay behind equipment.” Under TPE, equipment transfers directly from units redeploying home to the units taking their place.<sup>326</sup>

As part of the strategy to address effects of the harsh operating environments and the high operations tempo, the Army has increased maintenance capacity in theater to be able to provide near-depot level capabilities. For example, it established a HMMWV refurbishment facility in Kuwait and a Stryker maintenance facility in Qatar. The HMMWV facility workload includes modernization and upgrades as well as refurbishment. Established in July 2005, by December 2005, the facility had prepared a total of 264 HMMWVs.<sup>327</sup>

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At the same time, the Army is also reconfiguring its prepositioned equipment set, retaining some equipment in theater to reconstitute APS-K (APS 5). The focus of the current Reset program is to build two brigade-sized equipment sets in Kuwait, as well as battalion-sized sets in Qatar and Afghanistan. Equipment to form these sets is coming from a combination of items left in theater, as well as equipment transferred from depots and other units around the world.<sup>328</sup>

As successful as these initiatives have been in rapidly equipping troops in theater, they do carry inherent risks. For example, materiel retained in theater does not receive depot-level overhaul. This may mean that more equipment may require more extensive and more expensive repairs. Retaining equipment has also caused shortages in equipment for non-deployed units, Active, Guard, and Reserve.<sup>329</sup>

**AFSB-KU.** Much of the Army effort is centered on the Army Field Support Brigade-Kuwait (AFSB-KU), at Camp Arifjan, which not only supported the warfighter with refurbished, repaired, and new equipment, but has also Reset the APS in the CENTCOM area of operations.

Re-establishing the APS fleet required a major effort. Most of the equipment came from units redeploying home. The stock includes equipment and vehicles to field a heavy BCT, a light BCT, and a light battalion. “The idea,” explained LTC Lawrence Fuller, commander of AFSB-KU, “is for a brigade to come through here and draw this equipment. . . . They draw it, put all the things into it that they need, and then use it to fight the battle.”

At the same time, the AFSB has supported units currently in Iraq, Afghanistan, and Kuwait by refurbishing vehicles, retrograding equipment, and issuing TSS. Vehicles considered to be in fair condition are refurbished and rebuilt. As MSG Les Mortensen, AFSB-KU quality assurance noncommissioned officer (NCO) in charge, explains, “It’s like restoring an old car. It gets a new engine, brakes, upgraded kits, and paint job.”

The TSS allows the AFSB to get equipment and vehicles to Soldiers in theater. As LTC Fuller notes, the TSS is separate from the APS fleet and is given out in “onesies” and “twosies” as replacement. Recently, task forces under 2<sup>nd</sup> BCT, 1<sup>st</sup> AD were sent into Iraq with HMMWVs and Bradleys that had been repaired in theater.

For materiel no longer serviceable, the AFSB has established a retrograde lot. “They are used and abused pieces of equipment,” MSG Mortensen said. “When vehicle repairs are too labor intensive or there is an overstock . . . they are pushed back to the states.”<sup>a</sup>

Moreover, the continuing Reset efforts must support and configure to the new modular force structure. GEN Kern highlighted one major question: “Instead of putting everything back where it came from, the second set of issues is, where is it going?”<sup>330</sup> And Reset must also compete for funds in an environment of constrained budgets. Reset, replacement, modernization, transformation, and modularity are all worthwhile but sometimes competing priorities.<sup>331</sup>

To meet these challenges and to manage the Army’s equipment more efficiently, AMC and its partners have introduced two major initiatives aimed at providing materiel and improving maintenance. Analogous to the TPE or “stay behind equipment” transferred in theater is the Left Behind Equipment (LBE), the materiel left behind at home station when a unit deploys. Developing the two pools of equipment has enabled the Army to reduce the amount of equipment a unit has to transport from home station to deploy to Iraq, and it has provided flexibility in the management of materiel remaining at home station while the unit deploys.

This LBE can be a significant block of equipment. For example, the 10<sup>th</sup> Mountain Division had three brigades deploy, resulting in 20,000 pieces of equipment left behind. It is not good business for equipment to sit idle in one location while Soldiers at other sites need equipment for training. Then, too, that equipment needs to be maintained, and under Transformation and Modularity, that unit might redeploy to a new duty station. The Army needed a program to manage the LBE while supporting training, other unit equipment needs, and the pipeline going into Reset and recapitalization programs.<sup>332</sup>

AFSC took on the mission of managing the LBE process at Army installations to assist deploying units and local Directorates of Logistics (DOLs). AFSC personnel deploy to an installation and work with the deploying unit and the local DOL to identify equipment that requires maintenance or that can be used for recapitalization or Reset or to fill other

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<sup>a</sup> SPC Michael R. Noggle, “AFSB Pushes Out Equipment: War in a Box,” *Desert Voice* (June 21, 2006), pp. 8-9.

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shortages.<sup>333</sup> GEN Griffin explained, “Our goal is to provide a unit commander with one point of contact for maintenance management, contracting support, and connectivity with the national sustainment base that the unit needs to accomplish its Reset mission most effectively.”<sup>334</sup>

To date, AFSC has assisted in the management of LBE at Fort Drum, NY, and Fort Bragg, NC. COL Jeffrey J. Snow, Commander, 1<sup>st</sup> Brigade, 10<sup>th</sup> Mountain Division described the process.<sup>335</sup>

**On the one hand, in Iraq.** *“We are leaving most of our up-armored humvees and a lot of our equipment for other coalition forces, either in theater, or it’s my understanding that some of that will go into Reset for other units.”*

**On the other hand, back home.** *“We will go about the business of recovering our equipment that we ship back, and then drawing equipment, what we call left behind equipment, that’s currently waiting back there at Fort Drum for us, and rebuilding our equipment sets for the units.”*

AMC is also working closely with TRADOC in the Fleet Management Initiative (FMI), in which AMC is maintaining the training fleet for the schoolhouse. This will allow TRADOC commanders to focus on their core competency – training, while AMC applies its competencies in supply and maintenance management, thereby achieving better readiness of the training fleets.

As MG Mitchell H. Stevenson<sup>a</sup> tells it, in 2002, GEN John N. Abrams, Commanding General, TRADOC said he was having trouble operating his training fleet at Fort Knox, KY, and he asked if AMC could take that over. In making the request, GEN Abrams set three conditions or standards: the new arrangement would cost no more than the current operation, readiness rates would be at least as good as current, and no training would be missed due to the lack of equipment. As a result, FMI was established as a joint partnership between AMC, TRADOC, and the Installation Management Agency (IMA), and pilot programs were started in February 2003 at Fort Rucker, AL, for aviation and at Fort Knox for ground equipment.<sup>336</sup>

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<sup>a</sup> At the time, MG Mitchell H. Stevenson was DCS for Operations/G-3 at AMC. He is now the Commanding General, U.S. Army Combined Arms Support Command, succeeding MG Dunwoody in October 2005.

AMC's vision was to extend, integrate, and leverage its R&D, acquisition, and sustainment capabilities to the training sites in order to establish a single life-cycle support system for each fleet. AMC's strategy was to align each training site with an AMC MSC, thereby directly linking the site to the Army's industrial base and ALT community. Basically, AMC's concept was to centralize management of related functions, synchronize maintenance and supply activities, enhance long-range planning, and apply process improvements.<sup>337</sup>

During the pilot programs, responsibility for maintenance and supply operations at Fort Rucker were placed under the operational control of AMCOM, and the responsibilities at Fort Knox were placed under TACOM. In both cases, the readiness of the training base equipment was improved, the programs of instruction were met, and the maintenance costs were reduced.<sup>338</sup> For example, GEN Griffin points to estimates of \$60 million in savings at TRADOC, about \$31 million each at Fort Rucker and Fort Knox between actual savings and deferred costs.<sup>339</sup>

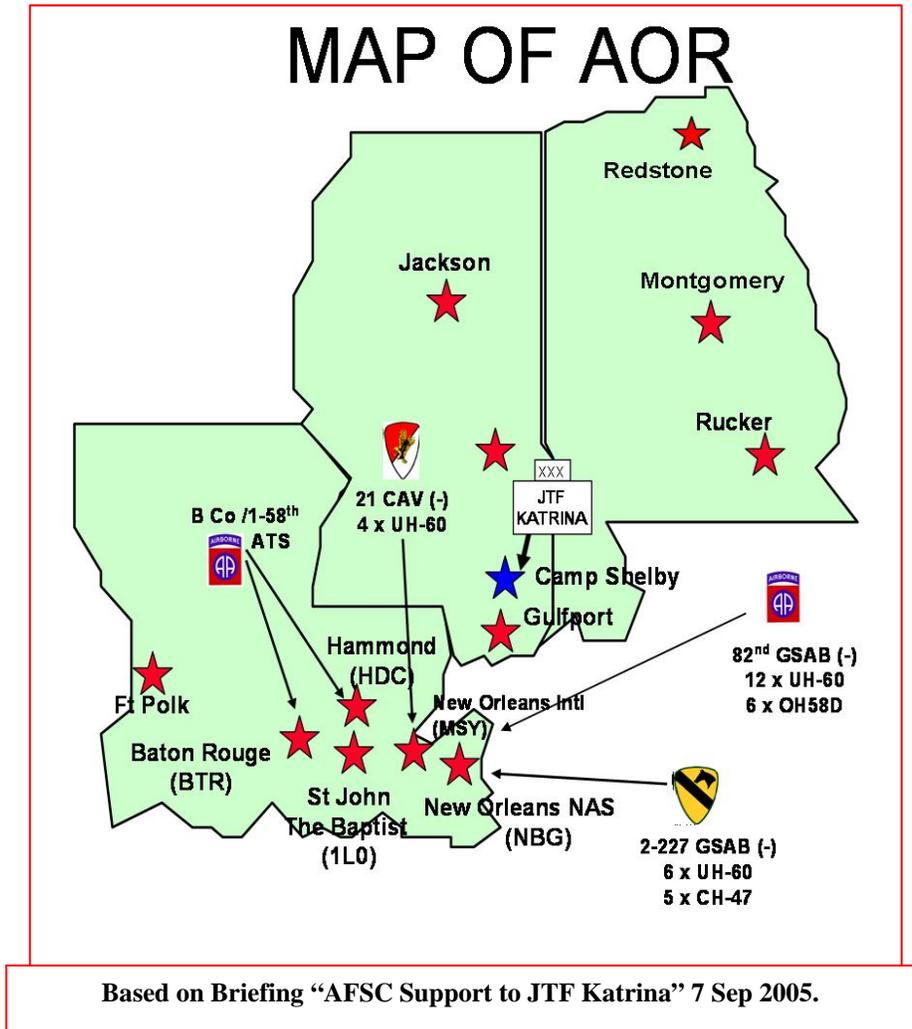
With the success of the pilot programs, AMC and TRADOC have joined forces to expand the FMI into the Fleet Management Expansion program, as outlined in the Training Base Equipment Readiness Plan. AMC, TRADOC, IMA, and other supporting principals as partners in the endeavor will extend the logistics support arrangement to TRADOC fleets at Forts Benning, Sill, Lee, and Leonard Wood.<sup>340</sup>

## **Humanitarian Efforts**

Hurricane Katrina struck the Louisiana, Mississippi, and Alabama Gulf Coast area on the morning of August 29, 2005, with Category Force III winds and accompanying tidal surge and heavy rain. The next day, the levees in New Orleans gave way. Almost immediately, Army units were dispatched to assist in search and rescue and humanitarian relief operations.

LTG Russel Honoré, Commander, 1<sup>st</sup> U.S. Army, set up Joint Task Force Katrina (JTF-K) at Camp Shelby, MS, on August 31 as the Defense Department's focal point to support relief efforts along the Gulf Coast. On September 3, Soldiers from the 82<sup>nd</sup> Airborne Division were deployed to New Orleans as part of Task Force All-American. Many of the Soldiers deployed were later sent into southwestern Louisiana to provide food and water after

Hurricane Rita swept through that region on September 24. A substantial number of the Soldiers had just returned from tours to Iraq or Afghanistan. Their response to the new taskings was simple, “We’re helping our own.”<sup>341</sup>



AMC moved quickly and responsively to support JTF-K, Task Force All American (82<sup>nd</sup> Airborne Division), the 13<sup>th</sup> Corps Support Command, and others. AFSC stood up the Army Field Support Brigade-Katrina (AFSB-K) at the New Orleans International Airport. LARs accompanied their respective units, specifically the 82<sup>nd</sup> and the 1<sup>st</sup> Cavalry Division. At the peak, AMC had about 190 people in the Joint Operations Area, military, civilian, and

contractor. However, JTF-K declined a proposed LOGCAP statement of work.<sup>342</sup>

The Soldier Systems Center (SSC) Natick was tasked through the TACOM LCMC to provide containerized life support (CLS) systems, to include latrine sets, shower sets, laundry sets, electric kitchen sets, a fresh water system, a waste water system, and power generators. Natick also sent a contracting officer representative to support the contract for operation and maintenance of the life support systems.<sup>343</sup>



**C-E LCMC personnel prepare to deploy satellite communications equipment in New Orleans in the aftermath of Hurricane Katrina. U.S. Army photo Submitted by CECOM.**

The C-E LCMC provided communications equipment and personnel. For example, it operated QuicLINK (on loan from Ericsson) to support the 82<sup>nd</sup>, FEMA, and local relief workers in New Orleans. A mobile personnel communications services system, QuicLINK facilitated cellular calls, T1 communications, data transmission, and streaming video. Later, Soldiers and contractors from C-E LCMC set up satellite equipment in the St. Tammany Parish Emergency Operations Center to provide telephone and internet services support.<sup>344</sup>

In another example, COMPASS (Compact Army Spectral System) was operated out of Waxahachie, TX, for NORTHCOM (U.S. Northern

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Command). This system, mounted in a DC-3 aircraft, is used to detect chemical contamination, such as chemical or POL leaks. CERDEC provided a team that flew COMPASS missions over New Orleans.<sup>345</sup>

TARDEC provided Technical Assistance Teams (TATs) to operate two Expeditionary Unit Water Purification systems, one in Biloxi, MS, and one in Pascagoula. Each system could provide 100,000 gallons per day. TARDEC also provided TATs to operate a Tactical Water Purification System and two Reverse Osmosis Water Purification Units at Waveland, MS.<sup>346</sup>

GEN William B. Caldwell, IV, Commander of the 82<sup>nd</sup> and Task Force All American, on redeployment back to Fort Bragg, thanked the “entire AMC team” for their “superb support” and specifically cited the aviation LARs. Caldwell mentioned the AMC “fly-away” communications package that provided critical capability, forklift and cargo handling operations, and responsive maintenance support.<sup>347</sup>

AMC installations also provided vital storage and staging areas for FEMA. For example, FEMA used land at Lone Star Army Ammunition Plant and Red River Army Depot at Texarkana, TX, as a FEMA storage/distribution point for mobile homes and recreational vehicles to be used as temporary housing for hurricane survivors.<sup>348</sup> In addition, the NASA Stennis Space Center became the primary staging base for FEMA in the Gulfport, MS, area. The Mississippi Army Ammunition Plant, a tenant on Stennis, became a focus of activity for FEMA, the U.S. Forest Service, the National Guard, Marines, and others.

Then, in October 2005 when a massive earthquake devastated parts of Pakistan, AMC mobilized its deployed personnel to provide communications, transportation and construction vehicles, electronics, repair parts, fuel, food, and medical supplies. Coalition Joint Task Force – 76 tapped AFSB-Afghanistan to operate a logistics cell at Qasim Airbase in Pakistan to support Task Force Griffin (Pakistan). The small team of logisticians, engineers, NCOs, and a contracting officer enabled the commander of the relief effort to rely on a single, reliable point of contact to provide logistics coordination. First, the cell supervised construction of a base camp; then they supervised expansion of the airfield.<sup>349</sup>

The Task Force delivered much needed supplies and evacuated critically wounded patients. In 10 days of continuous flying, the Task Force delivered more than 425 short tons of emergency supplies and evacuated more than 1,000 refugees and patients.<sup>350</sup>

The Soldiers sent to assist in humanitarian efforts were housed in Force Provider tents, and KBR was tasked to provide manpower to maintain equipment and assist in airfield operations.<sup>351</sup>

### **DLA Rallies to Support Humanitarian Relief.<sup>a</sup>**

**Indian Ocean Tsunami.** The 8.9-magnitude earthquake that hit off the coast of Indonesia on December 26, 2004 triggered extremely large waves that brought massive flooding, damage, and loss of life in the region. Personnel of the Defense Supply Center Philadelphia (DSCP) Medical Department's Emergency Supply Operations Center spent much of the holiday period preparing for and filling requirements for the *USNS Mercy*, a hospital ship that would deploy from its home port in San Diego to support the stricken region.

In combat, the *Mercy* provides rapid, flexible, and mobile acute medical and surgical services to support Marine Corps air and ground task forces deployed ashore, Army and Air Force units deployed ashore, and naval amphibious task forces and battle forces afloat. In its peacetime role, *Mercy* provides mobile surgical hospital service for use by U.S. government agencies in disaster or humanitarian relief or limited humanitarian care incident to these missions or peacetime military operations.

Steve McManus, deputy director of the Medical Directorate explained, "We're stocking the ship with everything you would find in a large hospital, pharmaceuticals, bandages, vaccines, pain pills, lab supplies, medical/surgical items. The list goes on and on."

**Hurricanes Katrina/Rita.** The Agency deployed about 19 people to work positions in support of Katrina and Rita relief efforts. DLA Director Vice Adm. Keith W. Lippert, noted "We had people in NORTHCOM, people down in Louisiana and Texas, and we deployed with the 82<sup>nd</sup> Airborne – all that was

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<sup>a</sup> DLA, Submission for this project, "DLA Chapter for 'From the Lab and the Factory to the Soldier in the Foxhole,'" pp. 41-45.

### Chapter III

part of the whole relief effort. In many ways, it was similar to what we would do in a war zone scenario.”

The director said the immediate problem centered on getting food to the people. “We ended up providing 24.4 million MREs from stocks from all over the continental United States,” he said. “We can provide support through 26 distribution networks worldwide: 19 here in the continental United States and seven overseas. All but one of them provided support to victims of hurricanes Katrina and Rita.” In addition to the MREs, the Agency also provided ice, bottled water, generators, trucks, medical and pharmaceutical supplies, and fuel for its people.



**Defense Distribution Center's first shipment in support of hurricane relief efforts. Cargo slings are loaded onto aircraft at Harrisburg International Airport, Middletown, PA. After loading, the planes departed for Louisiana.**

**Pakistan Earthquake** Following the devastating earthquake of October 8, 2005, U.S. Central Command, in coordination with the U.S. Embassy in Pakistan, established Disaster Assistance Center-Pakistan (DAC-PAK) at Chaklala, opposite the Islamabad International Airport. The mission of DAC-PAK was to assist with the receipt and distribution of humanitarian supplies flowing into Pakistan.

Almost immediately, DLA's Contingency Support Team-Kuwait began identifying available material at the Defense Reutilization and Marketing Service (DRMS) yard in Kuwait. DRMS personnel, in conjunction with CFLCC, began palletizing tents, sleeping bags, cots, insect netting, water cans, lumber, winter clothing, tools and other required supplies for shipment to Pakistan.

On November 11, DSCP received \$12.9 million from the Defense Security Cooperation Agency for 3,116 tents, 600 tent heaters, and 200,058 blankets previously identified as available DLA stock. A total of 14 commercial 747s were required to move the 506 air pallets built by DLA and shipped to Pakistan.



**Defense Distribution Depot Susquehanna (DDSP) employees built and shipped 340 air pallets of humanitarian aid material for Pakistan in less than six days. Submitted by DLA.**

## **Chapter IV**

### **Avenues of Change: The Way Ahead**

*Supporting the Warfighter is our number one priority. We are at war today and transforming for tomorrow.*

*The Army G-4 is fully engaged in supporting our Army at war and the ongoing comprehensive transformation of our forces. As the structure of Army forces is modified to meet the new demands of a changing battlefield, support to those forces is being transformed, as well. We in the G-4 are focusing on creating a network-enhanced, distribution-based supply system capable of providing rapidly responsive and flexible support to a joint expeditionary force. Making sure Soldiers get what they need is our number one priority on today's battlefields and tomorrow's.*

*To remain relevant and ready for present and future missions, the Army G-4 is significantly transforming, restructuring our organization, and revising business processes in order to better support the Soldier. The G-4's vision is to be a catalyst for strategic, adaptive logistics change. To provide proactive, responsive, forward looking logistics expertise. To create an environment where the Army and Joint force trust logistics and view the system as seamless and fully integrated. The new organization is designed to be adaptive, with the ability to anticipate and preempt problems and take advantage of opportunities in Army logistics.*

**LTG Ann E. Dunwoody, Deputy Chief of Staff for Logistics, G-4<sup>352</sup>**

As innovative and aggressive as logisticians have been in striving to “get the right supplies to the right place at the right time for the joint force,” they are determined to continue improvements to meet the needs of the warfighters, both in SWA and as part of the modular Army, as projected by GEN Peter J. Schoomaker, Chief of Staff, Army, as well as the Joint force. Thus, logistics leaders are pursuing organizational, doctrinal, training, and process changes to

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prepare for future challenges and have laid out their visions for meeting those needs.

GEN Griffin emphasizes the Joint aspects both in who AMC supplies and in who AMC works with.

*We have moved to strengthen our relationship and interoperability and communications with DLA. We run an operations update weekly. Field commanders in theater, in CONUS, or wherever they may be list their significant issues, problem areas, parts issues, maintenance issues, and readiness drivers. DLA is sitting right there with us, so as we identify problems, they are tracking them with us as well. They have folks collocated with us, forward-deployed, so they're in many of the same places we are.*

*We've also spent time with TRANSCOM and Air Force Materiel Command. We get great ideas from the Special Operations Force, the Navy, the Air Force, and the Marine Corps. We work with the Office of the Secretary of Defense (OSD) on the Joint Logistics Board, and we do a lot of other work with the AL&T community. I like to think we are a strong and growing partner in the Joint and OSD communities.*

**GEN Benjamin S. Griffin**<sup>353</sup>

## CASCOM

MG Ann E. Dunwoody, Commanding General, CASCOM from September 2004 to October 2005,<sup>a</sup> supported the joint logistics concept: “This new concept is the first ever that leverages these joint and strategic partners both in the national sustainment base and in a joint operations area (JOA). This end-to-end concept transforms our current logistics capabilities while increasing both effectiveness and efficiency in support.”<sup>354</sup>

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<sup>a</sup> Now Lieutenant General Dunwoody is the DA DCSLOG/G-4.

MG Dunwoody explained her vision: “Army logistics must be capable of supporting all operations across the full range of military operations in a joint, interagency, and multinational environment in a continuous and distributed manner.”

To enhance joint interdependency, CASCOM worked with TRADOC, U.S. Forces Korea (USFK), PACOM, Joint Forces Command (JFCOM), and TRANSCOM to design and test a joint logistics command in Korea. The 19<sup>th</sup> Theater Support Command (TSC) will convert to an Expeditionary Support Command (ESC) and will then transform into a joint logistics Headquarters to support the Korean Theater of Operations. This allows the Army to identify the augmentation it would need to become a joint headquarters and offer joint command capabilities if asked to do so.

Other joint initiatives include partnering with the Military Surface Deployment and Distribution Command (SDDC), the Army Service Component Command of TRANSCOM, to develop new capabilities in port opening and with DLA for forward positioning stocks within a theater of operations.

In a headquarters realignment provisionally stood up in April 2005, MG Dunwoody significantly changed CASCOM's process for supporting logistics Soldiers. She explained, “The move strengthens our logistics focus and supports better command and control across the doctrine, organization, training, materiel, leadership, personnel, and facilities spectrum.”

CASCOM traditionally has taken a branch-focused approach to logistics across the largest Combat Service Support (CSS) branches: Ordnance, Quartermaster, and Transportation. The new headquarters organization, with one Deputy Commander for Futures and one for Training, marks a significant change in that it integrates the workforce across multifunctional lines. Under the new realignment, problems can now be attacked at the functional level and the appropriate solution implemented – whether it is a revised force structure for a logistic unit, new training strategy to meet an emerging threat, or new equipment to alleviate a capability gap.

The CASCOM headquarters transformation will greatly facilitate implementation of the BRAC 2005 recommendations, which provide for the

establishment of several joint and Army training centers of excellence, including a Sustainment Center at Fort Lee, VA. Establishment of the Sustainment Center involves relocating elements of the Army Transportation Center and School from Fort Eustis, VA; the Army Ordnance Center and School from Aberdeen Proving Ground, MD; and the Army Ordnance Munitions and Electronic Maintenance School from Redstone Arsenal, AL, to Fort Lee. It also maximizes the capabilities already at the installation, such as the Army Logistics Management College and the Army Quartermaster Center and School.

This new Sustainment Center of Excellence will become the hub of logistics training for the Army. "For the logistics community, the BRAC recommendation to establish a focal point for Army logistics is the next logical step in our continuing transformation," said MG Mitchell H. Stevenson, current CASCOM Commander. MG Stevenson went on to emphasize the need for continuous monitoring of processes to ensure continuing improvement: "We will have to continue to meet the needs of our Army for trained logisticians."

### **LTG Dunwoody's Rucksack**

In October 2005, LTG Dunwoody became the Army's first woman DCSLOG/G-4. In this position, she continued to emphasize the need for Army logistics to operate in a joint environment. The concepts of distribution-based logistics, end-to-end visibility, connect the logisticians, and integrate the supply chain remained as goals, but she expressed them in somewhat different terminology. The general identified her goals in terms of a rucksack that contained five imperatives: Strategic Readiness, referring to maintaining a comprehensive view of unit readiness throughout the Army's cycle of force generation, deployment, and recovery; Futures, dealing with the requirement to plan, synchronize, and steer the implementation of the logistics portion of the Army Campaign Plan; Logistics Domain Automation, supporting the development and implementation of an aggressive computer governance plan that facilitates the fielding of logistics and business software and the retirement of outdated systems; Policy, calls for rapid and proactive policy staffing and fielding; Business Transformation and Innovation, endorses Lean Six Sigma, seeking to create "a culture of continuous, measurable improvement that eliminates non-value-added activities."<sup>355</sup>



## AMC

**“Avenues of Change”.** GEN Griffin has laid out a scheme of inter-related processes intended to provide the flexibility to meet the needs of today’s Soldiers in the field while also building and organizing to prepare for future demands.

The various components work together to advances his goals of –

-  Cradle-to-grave capabilities support
-  Efficient production processes
-  Customer focused solutions
-  Data driven decisions

Organizationally, AMC strives to be faster, quicker, and more responsive. The LCMCs tie together the R&D, Sustainment, and PEO/PM communities.

GEN Griffin on the LCMC concept. “It’s really a forcing function to ensure that folks are coordinating the cradle-to-grave, total systems approach.”<sup>356</sup>

The ASC, with the Field Support Brigades and Logistics Assistance Program, is the face to the field.

GEN Griffin on ASC. “They’re out there, meeting the needs of the customer, finding out what the problems are, and ensuring that we’ve got fixes.”<sup>357</sup>

In the longer view, it is crucial that the Industrial Base be maintained and strengthened.

GEN Griffin on the Industrial Base. “You can’t do a cradle-to-grave life cycle management system unless the depots are as efficient as they can be.”<sup>358</sup>

Moreover, AMC must be positioned to support the forces as they return from overseas to the revised basing structure.

GEN Griffin on positioning. “I want to make sure that AMC is established at those sites and installations to provide the level of support that we need from an Army Materiel Command.”<sup>359</sup>

The desire to change and improve is essential to meeting many of the goals. GEN Griffin emphasizes the need for processes to be quality driven, and he constantly preaches the benefits of Lean Six Sigma, but he also points to the need for more efficient planning.

GEN Griffin on planning. “I’d like to be able to run our depots on a better predictability model so that we know what’s coming in and know what requirements are going out.”<sup>360</sup>

To improve the planning, GEN Griffin points to the need for improved financial processes so that, for example, AMC could look out four or five years to pursue capital improvements.

GEN Griffin on financial management. “I’d like to see the logistics management system up and running and integrated with other data management and financial systems inside of the military.”<sup>361</sup>

AMC provides an array of services, pushing forward capabilities through Forward Repair Activities and pursuing initiatives such as Left Behind Equipment and Fleet Management. GEN Griffin says the feedback is generally positive.

GEN Griffin on AMC support. “They know we are there. They see the direct results of what we are doing, and it’s paying great dividends.”<sup>362</sup>

However, he hastens to emphasize that it is a continuous process. One can never be satisfied but must always seek improvements, must seek to stay ahead of potential adversaries and threats.

GEN Griffin on staying ahead. “The way you do that is through research and development, science and technology, and accurate, timely feedback from the Soldiers in the field.”<sup>363</sup>

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Much of the change and many of the improvements depend on better data flow, and that involves processes all the way from financial management systems to prognostics and diagnostics on vehicles.

GEN Griffin on data flow. “I don’t think you can get there with prognostics and diagnostics without a data system, a digital data system that allows you to be able to transmit that information.”<sup>364</sup>

**Army Sustainment Command.** On September 22, 2006, AMC stood up its newest MSC, the Army Sustainment Command (ASC), headquartered at Rock Island, IL. GEN Griffin hosted the ceremony and explained, “The Army Sustainment Command is AMC’s face to the field, designed to better support the operational Army both in the Continental U.S. (CONUS) and forward deployed around the world. We’ve incorporated lessons learned from Iraq, Afghanistan, Germany, Korea, and within the U.S. to build an organization which incorporates maintenance, acquisition, research and development, contingency contracting, and materiel management.”<sup>365</sup>

MG Jerome Johnson, Commander of ASC, stressed the significance of the new organization, “With our Field Support and Contingency Contracting



**MG Jerome Johnson (left), COL Rocky Easter (center), and GEN Benjamin S. Griffin pass in review during the ASC activation ceremony. U.S. Army photo by Ted Cavanaugh.**

Brigades spanning the globe, we are fused to the field Army. For the first time in one command, we're providing Soldiers a direct line to the strategic capabilities of life-cycle management commands, program managers, research agencies, and manufacturers.<sup>366</sup>

The intent is clear. The ASC mission is to improve logistics support to both Continental and overseas units and to the combatant commanders by harnessing and delivering the capabilities of AMC and America's industrial and technical base. The ASC continues the missions of the former Army Field Support Command, including management of pre-positioned stocks, administration of LOGCAP, and operation of the Logistics Assistance Program (LAP). New responsibilities include Reset synchronization, distribution and materiel management services, contingency contracting, and training equipment management.<sup>367</sup>

Basically, the Army is providing the Joint Force or Regional Combatant Commander with a single Army logistics commander by establishing new Theater Sustainment Commands to serve as the logistics C2 headquarters for the command. The ASC, then, provides the end-to-end distribution pipeline from the national sustainment base by coordinating with joint and strategic partners to support the TSC.<sup>368</sup>

Seven deployable AFSBs are assigned to ASC to provide a single command structure in strategic locations around the world, including Iraq, Kuwait, Korea, and Europe, as well as in the U.S. at Forts Bragg, Lewis, and Hood.<sup>369</sup>

AMC is also expanding its mission by standing up contingency contacting battalions and teams to keep divisions from competing against each other in purchasing goods and services. The new units will support commanders on the ground by coordinating purchases from local vendors. Having the capability to purchase supplies, equipment, services, and minor construction in and around the mission area adds vital flexibility.<sup>370</sup>

Two battalions and 14 teams were activated on July 28, 2006, aligned with the Field Support Brigades around the world. Additional teams will be established, as well as one more battalion and four Contracting Support Brigades (CSBs). The CSBs will be commanded by a colonel who will be dual-hatted as the Principal Assistant Responsible for Contracting. Thus, that

CSB commander will execute the Army Contracting Agency (ACA) mission to support local installations and the assigned component commander while integrating with the AFSB to ensure seamless contracting support to the combatant commander.<sup>371</sup>

“By consolidating the contingency contracting mission into AMC, we can provide a full range of contracted combat support and combat service support needed by our deployed forces,” explained LTG Mortensen.<sup>372</sup>

**Military Surface Deployment and Distribution Command (SDDC).** The Secretary of the Army has approved the assignment of SDDC as an MSC of AMC. Under this arrangement, SDDC comes under the administrative control (ADCON) of AMC, while TRANSCOM retains operational control (OPCON), and SDDC remains the Army Service Component Command to TRANSCOM. The goal is to improve distribution processes by enhancing coordination between the AMC logisticians and sustainers and the SDDC/TRANSCOM transporters; that is, to coordinate the end-to-end distribution pipeline. This connection should help all along that pipeline, but especially in the proverbial “last mile” in the on-going deployment and redeployment of forces and equipment, the shipment of fuel and parts, and the distribution of ammunition.<sup>373</sup>

**Condition Based Maintenance (CBM).** As an example of the impact to maintenance systems and services generated by improving data flow, AMCOM conducted a proof of principle demonstration of Condition Based Maintenance in 2005. Using concepts and techniques from the commercial aircraft industry, the Redstone Aviation Team placed sensors on a variety of helicopters to monitor several conditions. These embedded on-board diagnostic tools use emerging commercial and nano technologies to translate aircraft condition data – in combination with environmental factors – into proactive maintenance actions. CBM will enable Soldiers to plan and perform maintenance at the right place and at the right time. Plus it enables logisticians to predict equipment requirements more accurately so they can have the parts available when Soldiers need them.<sup>374</sup>

In November 2004, the DA DCSLOG/G-4 released a white paper on Aviation Condition Based Maintenance that laid out guidance, milestones, and vision for the transition to a CBM program by the end of FY 2015. This initiative marks a conscious shift from reactive, fault-based maintenance to a

proactive or predictive approach that performs maintenance upon evidence of need.<sup>375</sup>

For the proof-of-principle demonstration, the Redstone Aviation Team installed prognostics on Apaches, Black Hawks, and Chinooks, and test results validated benefits of increased readiness and reduced maintenance manhours. Specifically, analysis of the data produced estimates of increased readiness of 5.2 percent for the Apache (AH-64 Block III) fleet and 4.4 percent for the Black Hawk (UH-60 M Model).<sup>376</sup>

MG Pillsbury, Aviation and Missile LCMC: *“CBM will have a dramatic, positive effect in two critical areas: it will reduce the overall maintenance burden to the Soldier, and it will increase readiness to the warfighting commander.”*<sup>377</sup>

The demonstrations are scheduled to continue into FY 2008, but the Aviation Community is already moving into implementation, and MG Pillsbury has set Initial Capability for FY 2011.<sup>378</sup>

**Single Army Logistics Enterprise (SALE).** The CBM vision calls for these automated on-board and man-portable sensors to seamlessly integrate requirements and performance data into the Single Army Logistics Enterprise. Aviation maintainers from the flight line to the IMMC to the depot at Corpus Christi will have visibility of component failures and component availability across the Common Logistics Operating Environment (CLOE) and via the end-to-end logistics data warehouse.<sup>379</sup>

SALE consists of three major components, the Logistics Modernization Program, the Global Combat Support System-Army, and the Product Life Cycle Management Plus (PLM+). As an effort to centralize and integrate managerial functions across the logistics enterprise, SALE is an attempt to provide both a single, timely, and reliable information distribution capability as well as a common relevant operational picture that shows the strategic, operational, and tactical logistics posture.<sup>380</sup>

Gregory L. Kee, the AMC DCS for Strategy and Concepts/G-5, explained that, in SALE, the Army is developing an enterprise architecture to standardize end-to-end processes. “We’re trying to tie all the different pieces together so it’s seamless,” he said. “You can’t do all this without the

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technology. With standardized business practices and integrated supply information, we expect to improve our distribution system.”<sup>381</sup>

LMP will manage supply, demand, and asset availability at the national level, replacing the Commodity Command Standard System and the Standard Depot System. It has been deployed to more than 4,000 users in AMC, including C-E LCMC and HQ, AMC, and elements of the Defense Finance and Accounting Service (DFAS).<sup>382</sup>

GCSS-A, Field/Tactical (GCSS-A F/T) provides a single application for day-to-day tactical logistics. It replaces a variety of legacy systems such as the Standard Army Retail Supply System (SARSS), the Standard Army Maintenance System (SAMS), the Unit Level Logistics System (ULLS), and the Integrated Logistics Analysis Program (ILAP).<sup>383</sup>

PLM+ is the enterprise integrator, connecting not only the field Army with LMP at the national level but providing interfaces to external trading partners. Thus, PLM+ is the integrating hub and the master data manager. Plus it will provide a single access point for external customers such as TRANSCOM, DLA, and original equipment manufacturers.<sup>384</sup>

As of July 2006, a new program office has been established within the PEO for Enterprise Information Systems (PEO EIS), putting all three parts of SALE under the same manager for the first time. The Army projects partial implementation of PLM+ and SALE by FY 2007, with full operation in 2010 or 2011.<sup>385</sup>

Logistics enterprise integration is a complex process with many players, but SALE should provide the desired common operating picture and effective decision support tools for the Army and its service and coalition partners. Thus it becomes the third pillar of AMC transformation for the future – LCMC for capabilities support, ASC for the face to the field, and SALE for integrated data collection and management.



## **Appendix A**

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Dr. Peter S. Kindsvatter

**Defense Logistics Agency**

Ms. Joan Williams

**Appendix B  
Senior Leaders**

**Commanding Generals – Army Materiel Command**



**General Benjamin S. Griffin  
Nov 2004 – Present**



**General Paul J. Kern  
Nov 2001 – Nov 2004**



**General John G. Coburn  
May 1999 – Nov 2001**

**Commanding Generals – Combined Arms Support Command**



**Major General Mitchell H. Stevenson  
Oct 2005 – Present**



**Major General Ann E. Dunwoody  
Sep 2004 – Oct 2005**



**Major General Terry E. Juskowiak  
Aug 2002 – Sep 2004**

**Deputy Chiefs of Staff, G-4**



**Lieutenant General Ann E. Dunwoody  
Oct 2005 – Present**



**Lieutenant General Claude V. Christianson  
Sep 2003 – Oct 2005**



**Lieutenant General Charles S. Mahan, Jr.  
Oct 2000 – Sep 2003**

**Directors – Defense Logistics Agency**



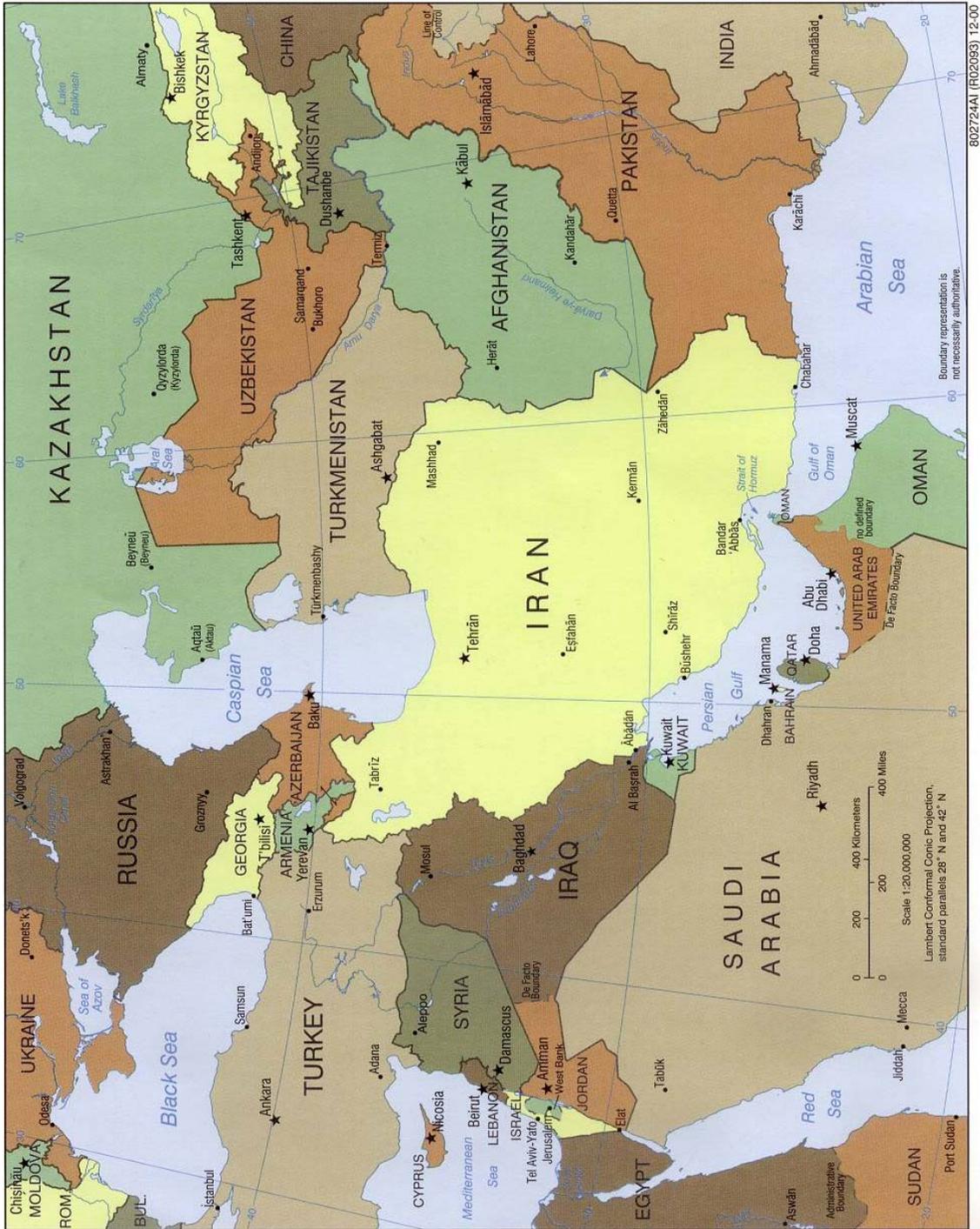
**Lieutenant General Robert T. Dail  
Aug 2006 – Present**



**Vice Admiral Keith W. Lippert  
Jul 2001 – Aug 2006**

# Appendix C

## Map – Middle East and Southwest Asia



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## Appendix D Brief Chronology of Events

Activities in the Balkans continued throughout the period	
<u>Southwest Asia</u>	<u>Environmental/structural</u>
2001	2001
<b>September 11</b>	
Terrorist attacks	
Security guards at chemical weapons sites	
Anthrax attacks	
Forces deployed to Afghanistan	
AMC LSE-SWA at Camp Doha, Kuwait	
LOGCAP support into Philippines	
Redistribution of assets from Qatar to Kuwait begins	
2002	2002
“axis of evil” in State of the Union Speech	Logistics Transformation Task Force
APS planners to SWA	Ground Systems Industrial Enterprise
Redistribution of assets from Europe to Kuwait begins	Lean
Increased funding for spare parts, etc.	Business Systems Modernization, DLA
Beginning to augment facilities in Kuwait and to build new	RDECOM
Tobyhanna Forward Repair Activity in Qatar	CMA
Operation Vigilant Hammer I	
Camp Arifjan, Kuwait opens	
3 <sup>rd</sup> ID(M) doing rotations into and out of Kuwait	
LOGCAP goes into SWA, Djibouti, and Jordan	
Rapid Fielding Initiative	
DLA Defense Distribution Center forward site in Kuwait (DDZZ)	

<b>2003</b>	<b>2003</b>
3 <sup>rd</sup> ID(M) begins to deploy to Kuwait and draw APS	AFSC
More Forward Repair Activities into Kuwait	White Paper on Transformation of the Defense Industrial Base
“Thunder runs” into Baghdad	Fleet Management Initiative
End of decisive military operations	Single Stock Fund operational
AMC LSE-Iraq (Balad/Anaconda)	Logistics Modernization Program goes “live”
RTCH tiger team	
HMMWV Service Center	
Armor Survivability Kit	
USAF into Balad/Anaconda	
<b>2004</b>	<b>2004</b>
CENTCOM Deployment and Distribution Operations Center	First Regional Flotilla at Guam
Battalion Sets I for MNSTC-I	Life Cycle Management Command Memo
IED Countermeasure Equipment	South Asian Tsunami
DLA Central Command	
<b>2005</b>	<b>2005</b>
500,000 <sup>th</sup> Soldier equipped by Rapid Fielding Initiative	Base Realignment and Closure Commission
Theater Sustainment Stocks	U.S. Army Industrial Base Strategic Plan, Part I
	Hurricanes Katrina and Rita
	Pakistan Earthquake
<b>2006</b>	<b>2006</b>
Field Support Brigades and Battalions	DLA Deployable Distribution Center
Contracting Support Brigades	Army Sustainment Command
	SDDC
	JMC

## **Appendix E GLOSSARY**

AAE	Army Acquisition Executive
AAP	Army Ammunition Plant
ACH	Advanced Combat Helmet
ACP	Assault Command Post
ACR	Armored Cavalry Regiment
ACU	Army Combat Uniform
ADCON	Administrative Control
AFSB	Army Field Support Brigade
AFSB-I	Army Fields Support Brigade - Iraq
AFSB-K	Army Field Support Brigade - Katrina
AFSB-KU	Army Field Support Brigade - Kuwait
AFSC	Army Field Support Command
AIM-9	Sidewinder
AKO	Army Knowledge Online
ALAT	Automated Logistics Assistance Teams
ALT	Acquisition, Logistics, and Technology
AMC	Army Materiel Command
APOD	Air Port of Debarkation
APS	Army Prepositioned Stocks
ARCENT	Army Central Command
ARDEC	Armaments Research, Development, and Engineering Center
ARF	Army Regional Flotilla
ARL	Army Research Laboratory
ARMS	Armament Retooling and Manufacturing Support
ASA (ALT)	Assistant Secretary of the Army (Acquisition, Logistics and Technology)
ASC	Army Sustainment Command
ASK	Armor Survivability Kit
ASPI	Arsenal Support Program Initiative
ATK	Alliant Techsystems
AVCRAD	Aviation Classification and Repair Activity Depot

AWCF	Army Working Capital Fund
BCS3	Battle Command Sustainment Support System
BCT	Brigade Combat Team
BDAR	Battle Damage Assessment and Repair
BFT	Blue Force Tracking
BPW	Breach Point West
BRAC	Base Realignment and Closure Commission
BSM	Business Systems Modernization
C2	Command and Control
C3T	Command, Control, and Communications Tactical
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CAM	Centralized Ammunition Management
CASCOM	Combined Arms Support Command
CBM	Condition Base Maintenance
CBRNE	Chemical, biological, radiological, nuclear, and enhanced high-yield explosives
CBS-X	Continuing Balance System - Expanded
CDDOC	CENTCOM Deployment and Distribution Operations Center
C-E	Communications-Electronics
CEB	Combat Equipment Group
CEB-AR (P)	Combat Equipment Group - Arifjan Provisional
CEB-K	Combat Equipment Group - Kuwait
CEB-Q	Combat Equipment Group - Qatar
CECOM	Communications-Electronics Command
CEG-E	Combat Equipment Group - Europe
CEG-SWA	Combat Equipment Group - Southwest Asia
CENTCOM	Central Command
CFLCC	Coalition Forces Land Component Command
CFO	Chief Financial Officer
CG	Commanding General
CG, AMC	Commanding General, Army Materiel Command
CITE	Center of Industrial and Technical Excellence

## Appendix E

CJTR-7	Combined Joint Task Force 7
CLOE	Common Logistics Operating Environment
CLS	Containerized Life Support
CMA	Chemical Materials Agency
COBOL	Common Business Oriented Language
COMPASS	Compact Army Spectral System
CONUS	Continental United States
COSCOM	Corps Support Command
COTS	Commercial-off-the-shelf
CRC	CONUS Replacement Center
CRM	Customer Relationship Management
CROWS	Common Remotely Operated Weapon System
CS&CSS	Combat Service and Combat Service Support
CSA	Chief of Staff, Army
CSC	Computer Sciences Corporation
CSSCS	Combat Service Support Control System
DA	Department of the Army
DAC-PAK	Disaster Assistance Center - Pakistan
DCD-ES	Directorate of Combat Development for Enterprise Systems
DCG	Deputy Commanding General
DCMA	Defense Contract Management Agency
DCSLOG	Deputy Chief of Staff for Logistics
DCST	DLA Contingency Support Teams
DDJC	Defense Distribution Depot San Joaquin, CA
DDRT	Defense Distribution Depot Red River, TX
DDSP	Defense Distribution Depot Susquehanna
DDXX	Deployable Distribution Center
DEMIL	Demilitarization
DESCOM	Depot Systems Command
DFAS	Defense Finance and Accounting Service
DISMS	Defense Integrated Subsistence Management System
DLA	Defense Logistics Agency
DoD	Department of Defense

DOL	Directorate of Logistics
DPMS	Distribution Planning and Management System
DRMS	Defense Reutilization and Marketing Service
DS	Direct Support
DSCP	Defense Supply Center Philadelphia
DSCR	Defense Supply Center Richmond
ECBC	Edgewood Chemical Biological Center
ECM	Electronic Countermeasures
EDCG	Executive Deputy to the Commanding General
EIS	Enterprise Information Systems
EOD	Explosive Ordnance Disposal
EPLRS	Enhanced Position Location and Reporting System
ESC	Expeditionary Support Command
FAC	Forensic Analytical Center
FBCB2	Force XXI Battle Command Brigade and Below
FEMA	Federal Emergency Management Agency
FFMIA	Federal Financial Management Improvement Act
FMI	Fleet Management Initiative
FMS	Foreign Military Sales
FMTV	Family of Medium Tactical Vehicles
FORSCOM	Forces Command
FP	Force Provider
FRC	FR Countermeasures, Inc.
GAT	Global Assessment Team (Air Force)
GATOR	Global Anti-Terrorism and Operational Readiness
GCS	Ground Combat Systems
GCSS-A	Global Combat Support System - Army
GCSS-A F/T	Global Combat Support System - Army Field/Tactical
GDLS	General Dynamics Land System
GSIE	Ground Systems Industrial Enterprise
GSP	Global Stock Positioning
HASC	House Armed Services Committee
HEMTT	Heavy Expanded Mobility Tactical Truck
HME	Heavy Mobile Equipment

*Appendix E*

HMMWV	High Mobility
HQDA	Headquarters, Department of the Army
HSV	High Speed Vessel
IBA	Individual Body Armor
ICE	IED Countermeasure Equipment
ICV	Infantry Carrier Vehicle
ID	Infantry Division
IED	Improvised Explosive Device
ILAP	Integrated Logistics Analysis Program
ILSC	Integrated Logistics Support Center
IMA	Installation Management Agency
IMMC	Integrated Materiel Management Center
IPDS	Inland Petroleum Distribution System
ISM	Integrated Sustainment Maintenance
IT	Information Technology
ITV	In-Transit Visibility
JCS	Joint Chiefs of Staff
JDLM	Joint Deployment Logistics Module
JFCOM	Joint Forces Command
JMC	Joint Munitions Command
JOA	Joint Operations Area
JSLIST	Joint Service Lightweight Integrated Suit
JTF-K	Joint Task Force - Katrina
KBR	Kellogg, Brown, and Root
LAO	Logistics Assistance Officer
LAP	Logistics Assistance Program
LAR	Logistics Assistance Representative
LBE	Left Behind Equipment
LCMC	Life Cycle Management Command
LCMR	Lightweight Counter Mortar Radar
LCOP	Logistics Common Operation Picture
LMP	Logistics Modernization Program
LMSR	Large Medium Speed Roll-on/Roll-off
LOGCAP	Logistics Civil Augmentation Program

LSA	Logistics Support Area
LSE	Logistics Support Element
LSE-SWA	Logistics Support Element – Southwest Asia
LSU	LOGCAP Support Unit
LTF	Logistics Transformation Task Force
M	Mechanized
MACOM	Major Army Command
MHE	Materiel Handling Equipment
MLRS	Multiple Launch Rocket System
MMCS	Multi-Media Communications System
MNSTC-I	Multi-National Security Transition Command - Iraq
MOLLE	Modular Lightweight Load Carrying Equipment
MPC	Material Processing Centers
MPH	Mobile Parts Hospital
MRE	Meals Ready to Eat
MRR	Munitions Readiness Report
MSC	Major Subordinate Command
MTS	Movement Tracking System
MTT	Mobile Training Team
NASCAR	National Association for Stock Car Auto Racing
NBC	Nuclear, Biological, Chemical
NCO	Noncommissioned Officer
NCR	National Capital Region
NORTHCOM	Northern Command
NSC	Natick Soldier Center
ODS/S	Operation Desert Shield/Storm
OEF	Operation Enduring Freedom
OIF	Operation Iraq Freedom
OPCON	Operational Control
OPS	Operation Project Stocks
OPTEMPO	Operational Tempo
OSC	Operations Support Command
P3	Public Private Partnerships
PACOM	Pacific Command

*Appendix E*

PBA	Performance Based Agreement
PBD	Program Budget Decision
PBUSE	Property Book Unit Supply, Enhanced
PEO EIS	PEO for Enterprise Information Systems
PLM+	Product Life Cycle Management Plus
PLS	Palletized Loading System
PM LIS	PM Logistics Information Systems
PMND	Polish Multi-National Division
PMO	Program Management Office
POL	Petroleum, Oil, and Lubricants
QASAS	Quality Assurance Specialist - Ammunition Surveillance
RAAP	Radford Army Ammunition Plant
RDE	Research, Development, and Engineering
RDEC	Research, Development, and Engineering Center
RDECOM	Research, Development, and Engineering Command
RFI	Rapid Fielding Initiative
RFID	Radio Frequency Identification
RMS	Rapid Manufacturing System
RTCH	Rough Terrain Container Handlers
SACC	Strategic and Advanced Computer Center
SALE	Single Army Logistics Enterprise
SAMMS	Standard Automated Materiel Management System
SAMS	Standard Army Maintenance System
SAPI	Small Arms Protective Inserts
SARSS	Standard Army Retail Supply System
SASC	Small Arms Support Center
SBCCOM	Soldier and Biological Chemical Command
SDDC	Surface Deployment and Distribution Command
SEPS	Shortstop Electronic Protection System
SFL	Soldier Focused Life-Cycle
SITREP	Situation Report
SMA	Supply Management Army
SOCOM	Special Operations Command
SOPAC	Special Operations Command, Pacific

SOSI	Systems of Systems Integration
SPBS-R	Standard Property Book System - Redesign
SRM	Supplier Relationship Management
SSA	Strategic Supplier Alliance/Supply Support Activities
SSC	Soldier Systems Center
SSF	Single Stock Fund
STAMIS	Standard Army Automated Information Systems
SUAV	Small UAV
SWA	Southwest Asia
TACOM	Tank-automotive and Armaments Command
TAP	Team Armor Partnership
TARDEC	Tank-Automotive Research, Development, and Engineering Command
TASM	Theater Aviation Single Manager
TAT	Technical Assistance Team
TDA	Table of Distribution and Allowances
TDC	Theater Distribution Center
TEU	Technical Escort Unit
TF	Task Force
TNT	Trinitrotoluene
TPE	Theater Provided Equipment
TPT	Tactical Petroleum Terminal
TRADOC	Training and Doctrine Command
TRANSCOM	Transportation Command
TSC	Theater Support Command/Theater Sustainment Command
TSS	Theater Sustainment Stocks
TSV	Theater Support Vessel
TV	Tactical Vehicle
UAV	Unmanned Aerial Vehicle
UIT	Unique Item Tracking
ULLS	Unit Level Logistics
ULLS-S4	Unit Level Logistics - S4
USAR	U.S. Army Reserve
USASAC	U.S. Army Security Assistance Command

*Appendix E*

USFK	U.S. Forces Korea
VSA	Value Stream Analyses
WLMP	Wholesale Logistics Modernization Program
WMD	Weapons of Mass Destruction
WVSC	Wheeled Vehicle Support Center



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