

THE MONITOR AND MERRIMACK



Newsletter of the
Greater Hampton Roads Chapter
District 02 – Chapter 03
SOLE – The International Society of Logistics
September 2009
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Vice Chair – Admin:

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From the Chapter Chairman:

Summer has slipped by quickly. School is back in session and we all look to the coming holidays. Our Chapter remains active in planning for stellar speakers at our monthly luncheons along with a variety of planned tours. Our incoming Membership Chair, **Brandon Cholek** and **Charlie Littleton**, our incoming Chairman have been especially active and successful in expanding our local contacts lists while setting up a variety of outstanding speakers. All our Vice Chairpersons have pitched in to fill our events calendar (we already are building a roster of speakers for 2010).

Lee Morris was our chapter representative at the SOLE International Conference and Exhibition held in August. Our Chapter's **Holley Tatem** received a prestigious Field Award while our Chapter was awarded the Gold Newsletter Award for the 2008-2009 Fiscal Year and a Chapter President's Award for Merit, recognizing our reach out efforts and membership success in the local Hampton Roads area.

Our monthly meeting this month is a unique opportunity to tour the operations of Kettler International in Virginia Beach (London Bridge Road), followed by lunch at Bubba's Deli and BBQ on Dam Neck Road. We ask that you sign up for lunch when RSVP'ing for the tour. Please note that the date for this tour has slipped to Wednesday, 30 September.

Our October (the 14th) Luncheon meeting features **Jesse Hines** the VP of Logistics for the world wide Operation SMILE. We will install our newly elected management team and our District Director Jon Buder will swear in all, including our new Chapter Chairman. This is a great opportunity to meet our District II Director. We also have **Steve Carmel** of Maersk Line, Ltd in November thanks to **Akalanka Warusavitharana**.

Later this month we will be attending the first of a series of Sessions with our District 2 Director, Jon Buder, District Chapters and SOLE HQ in planning another Professional Development Forum for the Spring of 2010. We will also get updated chapter management training.

We had an overflow attendance at our August Luncheon featuring **Jerry Gruden** of LCE speaking on the Navy's Obsolescence Program (please see page 6 of this newsletter).

We have a full slate of highly interesting speakers and events for the remainder of this year.

See you all at the 30 September Tour!

Carl J. Lilieberg
Chairman GHRC SOLE

Coming Events:

30 September 11:30 AM to 1 PM Tour of Kettler Intl. Operations, Virginia Beach, Va. (1355 London Bridge Road) with Lunch to follow at Bubba's BBQ, 3600 Dam Neck Road

Oct. 14, Mr. Jesse Hines, VP of Logistics and Material Management, Operation SMILE/ Installation of Chapter Officers (District Director Jon Buder)

12 November, 11:30 to 1 PM GHRC Luncheon Mr. Steve Carmel, Senior VP, Maritime Services, Maersk Line, Ltd, "Global Logistics Operations and Their Impact on the Tidewater Area"

9 Dec., Capt Bob Gannt, ACOS for Logistics & Financial Mgt, Navy Expeditionary Combat Command (NECC)

* GHRC Luncheons at Ward's Corner #1 Chinese Restaurant

Certified Professional Logistician Corner



The next CPL Exam
will be given in
November 2009

Networks and networking techniques can be used as solutions or simulation models for complex scheduling problems. Several techniques can be used to develop networks for planning and controlling projects. Two of the more familiar ones are Program Evaluation and Review Technique (PERT) and Critical Path Management (CPM). Knowledge of networks and network problem-solving is an essential skill for a practicing logistician or a logistics manager

Ref: Quantitative Approaches to Management by Levin, Rubin and Stinson

1. The first step in developing a PERT network is to:
 - a. Prepare an activity list.
 - b. Draw the network to display precedence relationships graphically.
 - c. Define network nodes and branches.
 - d. Establish a list of activity times.
2. Activity times in PERT networks are often expressed in :
 - a. Calendar days.
 - b. Hours to completion.
 - c. Calendar weeks.
 - d. Calendar months.
3. Which distribution is used to represent the probability distribution of times in a PERT network?
 - a. Poisson distribution.
 - b. Beta distribution.
 - c. Gamma distribution.
 - d. Normal distribution.
4. The time estimates from the distribution in question 3 are combined using:
 - a. Weighted moving average.
 - b. Moving average.
 - c. Weighted average.
 - d. Non-weighted moving average.
5. The critical path through a network is the path with the:
 - a. Longest path through the network.
 - b. Shortest path through the network.
 - c. The path with the fewest dummy activities.
 - d. The path with no dummy activities.
6. The term used to refer to all activities in a network is:
 - a. Legs.
 - b. Arms.
 - c. Branches.
 - d. Alternatives.
7. The latest start time refers to:
 - a. The latest time an activity can begin without extending the network.
 - b. The latest time of the network.
 - c. The latest time an activity can begin, even if it means extending the completion time of the network.
 - d. The time the last activity in the network can begin.

8. A forward pass is a process of moving through a network to define:
 - a. All the latest start and finish times in the network.
 - b. The latest start and earliest finish times for all activities in the network
 - c. The earliest start and latest finish times for all activities in the network.
 - d. All the earliest start and earliest finish times in the network.

Please see answers on page 3

Near term Calendar of Events

ASNE	Dinner Meetings:	Every 3 rd Tuesday, Springhill Suites, Newtown Road, Va. Beach, (1800-1900 Social Hour); 1900-2030 Dinner and Program; Reservations: Mary Morgan (757) 495-1970
	16 September	ASNE Fleet Luncheon VADM John J. Donnelly, COMSUBFOR: "U.S. Navy Submarine Force: Providing Current Capability and Future Opportunity"
	24 September	Joint Dinner with SNAME, USMMA, & VSRA, The Future of the Marine Industry in Hampton Roads – Panel Discussion.
SOLE		
GHRC SOLE	30 Sept 2009	Tour of Kettler International Operations, 1355 London Bridge Road, Virginia Beach, Va. (followed by Lunch at Bubba's Deli and Barbeque, 3600 Dam Neck Road.

Answers			
1	a	6	c
2	c	7	a
3	b	8	a
4	c		
5	a	1	

**SOLE – The International Society of Logistics
Greater Hampton Roads Area Chapter
Wednesday 30 September, 2009
11:30 – 1:00 PM**



**Tour of Kettler International Operations
1355 London Bridge Rd
Virginia Beach, Virginia**

Host: Mr. Ludger Busche



**Followed by Lunch at:
Bubba’s Deli and BBQ Restaurant,
3600 Dam Neck Road**

Please RSVP by contacting our Membership Chairman, Mr. Charlie Littleton at clittleton@LCE.com or phone him at 757-217-3575 or our Chairman, Carl Lilieberg @ 757-896-5335/Carl J. Lilieberg@ngc.com NLT 4 PM, Monday, 28 September 2009. Please join us for a luncheon of great food, professional contact, and a timely and informative logistics presentation. Spouses and guests, bosses, and co-workers are welcome and you DO NOT have to be a SOLE Member to attend!

Driving Directions: From I-64 E: after transiting the HRT follow I-64 to the 264 E (Virginia Beach /Norfolk Exit) bearing to the left onto 264 E; take the Lynnhaven south exit (19A) merging to Lynnhaven Parkway South; turn left on to Potters Road, then turn right on to London Bridge Road; 1355 is on the right. From Virginia Beach (I-64 east); take the Lynnhaven South ext (19A) and follow same directions as above. **For Bubba’s:** From 1355 London Bridge – go south on London Bridge toward Crusader Circle; stay straight to go on Drake Smile Road; turn right onto Dam Neck Road – 3600.

Project Apollo Lights the Way for Acquisition Success

Joe Moschler O Mike McGhee O Jerome Collins O James Weitzner

It has been just over 40 years since the fulfillment of President John F. Kennedy's goal of "landing a man on the moon and returning him safely to the earth." As we reflect on this technological triumph, we find numerous examples of acquisition best practices and lessons learned, many of which are manifest in our current DoD acquisition best practices – often out of necessity – and many of those ideas have evolved and are now common tenets of today's defense acquisition practices.

Project Apollo

In the early days of the space race, a new program, named Project Apollo, emerged as America's way to the moon. A developmental effort from the boosters up, Project Apollo initially had two major manned sub-systems – the Command and Lunar modules – and eventually gained a third sub-system called the Lunar Roving Vehicle, or Lunar Rover for short.

The Command Module was designed to carry a crew of three astronauts into orbit, then eventually return them safely through a fiery reentry and splashdown in the ocean. Prior to being launched, it sat atop a huge three-stage rocket that stood nearly at 363 feet—58 feet taller than the 305-foot Statue of Liberty—and had a diameter of 33 feet. The Lunar Module was located two stages below the Command Module on the rocket. It was a relatively fragile ship, with a cabin barely larger than the combined volume of two telephone booths. It provided adequate room for two pressure-suited astronauts, and no more. Its walls were about as thick as several layers of aluminum foil, and it was incapable of withstanding reentry into Earth's atmosphere.

Non-Developmental Items

The creation of the Command and Lunar modules and the Lunar Rover began with the Soviets' successful launch of Sputnik, the world's first manmade satellite. The National Aeronautics and Space Administration was desperate to respond to that achievement, and as a result, the organization resorted to what today we would call a non-developmental item. NASA started the Mercury and Gemini programs, which were the United States' first tentative flights into space, using existing inter-continental ballistic missile boosters and technologies from the Redstone, Atlas, and Titan missile programs. NASA engineers made reliability and safety modifications to the missiles so human life wouldn't be endangered by their use.

The nation's reputation as a world power was riding on this non-developmental but still cutting-edge technology. That same cutting-edge technology provided the foundation for the United States' early research, testing, and demonstration procedures and processes, such as ensuring a spaceship could rendezvous and dock—necessary steps in the United States' quest to win the race to the moon.

Cost and Risk

Today, we routinely cite cost as an independent variable while concurrently trying to balance schedule and performance as dependent variables; and NASA found balancing independent and dependent variables equally as difficult as we do today. President Kennedy set a schedule of "this decade" [*the 1960s*] as the independent variable. NASA soon came to realize the hard way—what we, in many cases, have yet to recognize today—that there is a fundamental law of acquisition: Program cost, schedule, and performance risks

are inversely proportional to the respective weighted relative importance of those same variables. Therefore, if an accurate program estimate exceeds the set limit for the independent variable, then the risks for one or both of the other two dependent variables will be elevated beyond established acceptable limits.

The prime example of that fundamental law in the Apollo program was the tragic launch pad fire of Apollo 1, killing astronauts Gus Grissom, Ed White, and Roger Chaffee. Following that tragedy, NASA coined the term "go fever" to describe what happens when schedule is permitted to reign supreme at all costs. Echoing that same sentiment, we say these days, "If you want it bad, you get it bad."

In the Apollo program's rush to meet schedule, acceptable performance risks were exceeded. Then, as now, the response was the necessary redesign and rebaselining of the program. Following that loss of three lives, NASA spent two years and millions of additional dollars to get back on a course for the moon with a totally redesigned Apollo capsule.

Managing the Pace of Change

Another initiative evident in Project Apollo that applies to today's acquisitions is the idea of design freeze to stem requirements creep—and that happened with the Lunar Module. NASA engineers correctly recognized that effective manufacturing planning and implementation could not be achieved with a constantly changing configuration; however, some design modifications were still necessary after the design was frozen. Those changes required rigorous reviews and prudent control. The risks associated with the delicate balance of making design modifications became apparent in the fifth Lunar Module manned flight, when it was discovered the onboard carbon dioxide scrubbers were not standardized with those onboard the Command Module. That almost became a fatal oversight, but was fortunately identified and overcome by creativity and ingenuity. The idea of design freeze and configuration control was clearly an early precursor to what today we call configuration steering boards.

Expanding Our Capabilities

One well-known but seldom-studied system from Project Apollo is the Lunar Rover. Taking some literary license, we can see how the evolution of that system best illustrates the logic and utility of our current defense acquisition management.

Early on in the Apollo program, Director of NASA's Marshall Space Flight Center Dr. Werner von Braun and NASA engineers and scientists knew they wanted to be able to explore the lunar surface beyond the immediate landing sites—there were limitations as to how far an astronaut could explore on foot. Just as the Joint Requirements Oversight Council now validates DoD requirements, NASA implemented a process to study and evaluate the capabilities necessary to meet their requirements. This work was similar to what we in DoD now refer to as a capabilities-based assessment. Von Braun and his staff were convinced of the practicality of the idea and developed a plan to pursue a materiel solution; and in today's terms, an initial capabilities document was born. With the equivalent of an approved initial capabilities document in hand, a materiel development decision was also approved and an initial materiel solution analysis was begun.

Evaluating the Options

A primary activity during the materiel solution analysis phase is to conduct an analysis of alternatives, which analyzes operational effectiveness, suitability, and life cycle costs of the alternatives that satisfy the established needs. However, the decision to begin the materiel solution analysis phase does not mean that a new acquisition program has been initiated. Capability

Because of the lack of understanding of what kind of terrain a lunar vehicle would encounter on the moon, many types of locomotion were considered, including an Archimedean screw device, a wide range of wheel types, and track designs. After the 1962-3 unmanned lunar probes provided more

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Greater Hampton Roads Chapter
SOLE - The International Society of Logistics

Chapter Business Meeting Minutes

Date: August 10, 2009

Location: Conference call and at Life Cycle Engineering office, 5301 Robin Hood Rd. Suite 108, Norfolk, VA

Meeting Convened: 4:30 PM

Meeting Closed: 5:05 PM

Attendees:

- Carl Lillieberg, Chapter Chairman
- Charles Littleton, Vice Chairman Membership
- Lee Morris, Vice Chairman Education
- Brandon Cholek, Member
- Rick Treto, Vice Chairman Treasurer

Minutes:

The Chapter Chairman called the meeting to order.

The Chapter Chairman asked for comments on the minutes from the last business meeting and having had no comments asked for a recommendation to approve the minutes. The motion was moved and seconded and then approved by the attendees.

The Vice Chairman Treasurer provided the Chapter Management Team the current Chapter budget information.

Chairman opened discussion on plans for calendar year 2010 Luncheons/Tours:

- STIHL Tour (Charlie)
 - Working with, Don Chase, Planning and Logistics Department at Stihl, Inc. for January tour.
- Ship Tours (Brandon)
 - George Busch - Wasp are possible tours.
- Inventory Control/Warehousing/Physical distribution FISC NORV, Def Depot NORVA, DHL/FedEx local reps, Sysco)
 - NEX, CISCO, Liebherr, - DLA (Brandon)
 - FISC Norfolk - CAPT Christopherson – Charlie
 - Rick – FEDEX
- Contracting – FISC (local society) Look into intro – Charlie
- Planning Shipyard - Norfolk Naval Shipyard
- Local Shipyards – NGC, BAE, other Small Sys – Colonna etc.
- Tidewater Business Societies – not started
- TASC/ASNE/ - not started
- NASA - Charlie waiting on response from PA

Chairman open discussion on mini-workshops tacked on to our Luncheons with Keynote Luncheon Speaker with follow on demos and presentations. After discussion it was agreed we need to pursue but need additional volunteers to execute.

Chairman opened discussion on the PDF for District 2 for 2010. Jon Buder has invited Carl to attend kickoff planning session tentatively for Sat 22 Sept. Charlie agreed to attend.

Mr. Cholek gave the update to the Contact Matrix Update. Very little activity has been completed but all agreed to move ahead on follow-ups and additional contacts.

Chairman discussed or October meeting. Newly elected Chapter Chairman and Vice Chairmen will be installed. Chairman will try to invite Ms. Sarah James or a member of the BOD HQ or President of SOLE (if available).

Chairman discussed August Meeting on Obsolescence in that this topic is already drawing interest – 4 sign ups from local industry – keeping a variety of great topics and speakers will eventually lead to more members. Everyone encouraged to advertise.

Chairman discussed the Intl Conference and Exhibition – Lee Morris who will be attending will get the President's Award of Merit at the scheduled dinner and the Gold Newsletter Award at the scheduled Luncheon. Ms. Holley Tatem will get her Field Award at the Dinner. Mr. Morris's registration has been paid; Ms. Tatem registration has not been billed to the chapter. Charlie will check on invoice from HQ.

Chairman open topic regarding Budget Projections/Creation Time. The Chapter will need to craft our budget for next year by end of September coordinated to our plans.

Chairman asked for Website Update (Charlie). Website hits are being monitored and a report will be provided at the next Chapter Management meeting. Renewal for the website service is up for renewal and all agreed for the two year renewal.

The Chapter Chairman asked for additional comments or business having had no comments asked for a recommendation to close the meeting. The motion was made and seconded and then approved by the attendees.

The Chapter Management business meeting was closed at 5:05 PM.

**GHRC August 19, 2009 Luncheon Meeting
#1 Chinese Restaurant, Wards Corners,
Norfolk, Virginia**



Our 19 August Luncheon featured Mr. Jerry Gruden, Program Manager at LCE, Inc. speaking on "The U. S. Navy Obsolescence Program". We had a higher than normal attendance at this very timely and interesting presentation covering the full breath and scope of the Navy Obsolescence Program for HME Navy Systems. Jerry also took time to field a number of real world operational questions from our many attendees, representing a good cross section of the local logistical managers in the Tidewater area. A copy of his presentation is to be posted to our GHRC website at ghrc-sole.org.

Project Apollo Lights the Way for Acquisition Success (Cont'd from Page 5)

detailed data about the moon's surface, scientists and engineers were able to make some design decisions.

NASA's initial concept for the Lunar Rover vehicle was a self-contained version that could transport two or three astronauts and provide sufficient living space for up to a two week excursion on the moon. It soon became evident that a vehicle for such a mission would weigh approximately 8,000 pounds and would require a dedicated Saturn launch rocket (meaning it couldn't travel with the Command and Lunar modules). NASA quickly realized that the cost and complexity of that plan were not acceptable, and subsequently revised their plans. As previously stated, the intent of the material solution analysis phase is to determine what solutions should be pursued or developed, if any. In the case of the initial Lunar Rover program, the material solution analysis process worked as expected, eliminating unfeasible options. In fact, none of the technologies investigated warranted further pursuit because of mission constraints. In particular, the alternatives considered were not realistically achievable because the costs associated with transport to the moon were too high in terms of tradeoffs and actual dollars.

One of the primary participants considered in the initial analysis was General Motors, and the company was determined that if there was to be a car on the moon, they were going to make it. They were willing to invest corporate funds to realize that vision, and their dedicated and innovative engineering team began to ask questions. What could be transported on the existing Lunar Module? What size? What weight? The wedge-shaped bay onboard the Lunar Module that was available to carry a small Lunar Rover.

The allotted cubic space and weight restriction would be critical design factors for the vehicle. Such a vehicle would not support the two-week excursion originally envisioned by NASA, but it would allow the astronauts to venture beyond their limited walking range. After two General Motors engineers demonstrated an ingenious prototype to von Braun, NASA decided to proceed once more with developments for a Lunar Rover. In a classic example of capability tradeoffs,

NASA reduced the requirements for the Lunar Rover from a vehicle that could transport two or three astronauts for a two-week journey to one that could simply extend the astronauts' range on the moon and could be transported on the Lunar Module

Maturing and Prototyping the Technology

With the benefit of hindsight, we would now say that NASA was entering what the defense acquisition community calls the technology development phase. The Lunar Rover had already made a long journey up to this point—but the journey was only just beginning. Although General Motors had developed an innovative and promising design, that did not guarantee them the contract award. NASA conducted full and open competition for the Lunar Rover contract.

Grumman Aircraft Engineering Corporation, the builder of the Lunar Module, entered a prototype that was a strong contender. It was a close competition, and Grumman very nearly won the bid with a design featuring conical wheels that could be removed and stowed together to save space. Grumman's design also had the capability to be remotely operated from Mission Control, even after the astronauts had returned safely home. But in the end, the ease of deployability was the deciding factor, and General Motors (partnered as a major subcontractor under Boeing), won the bid. Like a detachable Murphy bed with wheels, the General Motors design featured spring-loaded hinges that allowed for minimal exertion of the astronauts' energy

and time—it literally sprang out of the cargo hold. Although the Grumman design featured somewhat more robust performance characteristics, it also required a substantial amount of time and energy to assemble—resources that were just not available based on the limited supply of consumables.

Once the competitive prototypes were evaluated a contract was awarded to the General Motors Defense Research Labs—although Boeing was the prime contractor, the design was General Motor's baby. What we today call the engineering manufacturing and development phase began. The hard part was yet to come—actually building a vehicle that would fit onboard the Lunar Module and operate on the lunar surface once it arrived. Engineers faced the task of reducing technology risk through the maturing of critical technology elements. Additionally, the team had a very aggressive schedule of delivering the Lunar Rover—it had to be delivered in just 17 months if it was to be incorporated into Apollo 15.

From the onset of the program, deployability and weight were the two attributes of the Lunar Rover considered critical to the operation of the system. Today, we would call them the key performance parameters for the system. If the Lunar Rover could not be stored in the 5x5x5-foot wedge-shaped space in the Lunar Module, then it would not get to the moon. Furthermore, if the astronauts were not able to easily deploy the Rover once they arrived on the moon's surface, it would be of little value. Because the Lunar Module hovered over the moon's surface looking for a spot to land, weight of the vehicle was critical. Every ounce of additional weight carried meant a decrease in the available hover time for the Lunar Module pilot to find a suitable spot to land. Therefore, the Lunar Rover's maximum weight, or threshold, was set at 400 pounds. Of course, there were other key system attributes that had to be considered, such as reliability. Some of the technology development efforts General Motors undertook included developing a battery that both weighed less than 10 pounds and could dissipate heat during operation, capitalizing on the properties of wax the heat while in operation and then cool and dissipate that same heat when the Rover was not running. Another technology issue was that the dust on the moon adhered to everything it touched, so the engineers and scientists had to develop a wheel capable of shedding dust so it wouldn't build up on and around the hub and brakes. Their successful approach to that challenge resulted in a wheel constructed of woven piano wire.

The Rover in Action

The engineering manufacturing and development phase ended on schedule after 17 months, with delivery of the first Lunar Rover to NASA on March 10, 1971. The Lunar Rover was first used on July 31, 1971, during the Apollo 15 mission. The mission wasn't without problems, however. Once deployed on the moon, the Apollo 15 crew experienced problems with the front-wheel steering. Fortunately, the Lunar Rover also had rear steering, so the mission could continue. Thus, as that experience proves, even if significant developmental testing and operational assessments are done on a system, problems still can occur during operational testing on a deployed vehicle.

During the Apollo 15, 16, and 17 missions, the Lunar Rover traversed approximately 56 miles, allowing the astronauts to explore the moon's surface to an extent never before achieved.

Learning From the Past

The significance of the achievements and innovations of the Apollo program, and more specifically, the Lunar Rover program, is not lost over time. Even though the NASA engineers at that time didn't have the structured DoD acquisition management system to guide them as we do now, they still used a very systematic approach to acquiring the Lunar Rover and other Apollo systems. That systematic approach, when applied deliberately, led to great programmatic success for Project Apollo, as the Lunar Rover success demonstrates

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Project Apollo Lights the Way for Acquisition Success (Cont'd from Page 8)

The same disciplined approaches of the Apollo team members are as valid today, if not more so, than they were 40 years ago. The lessons and principles still apply in the strategic and tactical execution of programs, whether in support of a mission to the moon or providing for the daily support and protection of our troops.

(Reprinted from Defense AT &L, Sept-October 2009)

The authors welcome comments and questions and can be contacted at joe.moschler@dau.mil, mike.mcghee@dau.mil, jerome.collins@dau.mil, and james.weitzner@dau.mil.

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An Army Revolution in Military Logistics?

by Dr. David A. Anderson and Major Dale L. Farrand

(Reprinted from *Army Logistician*, July/August 2007)

In recent years, the Army has been continuously transforming logistics in support of Soldiers. This transformation has been driven by technological innovations, changes in the conduct of warfare, lessons learned, and the ever-expanding roles and functions of the military. But has this transformation been evolutionary, or has it been revolutionary, as advertised? Furthermore, is the Army's Revolution in Military Logistics (RML) truly a revolution in military affairs (RMA)?

According to the last three Chiefs of Staff of the Army (CASs), a revolution or transformation in military logistics is an integral and necessary part of an RMA, and the Army has been undergoing a self-proclaimed revolution of one form or another since Macgregor Knox and Williamson Murray, in their book, *Dynamics of Military Revolution*, define an RMA as follows: "Revolutions in military affairs require the assembly of a complex mix of tactical, organizational, doctrinal, and technological innovations to implement a new conceptual approach to warfare or to a specialized sub-branch of warfare." They also posit that there have been five RMAs in modern times: the early modern revolution, the French Revolution, the Industrial Revolution, World War I, and the genesis of Nuclear weapons.

The Department of Defense concurs with their definition of an RMA. According to the Secretary of Defense's Office of Net Assessment, "A revolution in military affairs is a major change in the nature of warfare brought about by the innovative application of new technologies which, combined with dramatic

changes in military doctrine and operational and organizational concepts, fundamentally alters the character and conduct of military operations." Has the progress or planned progress in the above-mentioned tenets combined been enough to say that the changes being made to logistics are revolutionary, or are they just evolutionary? Is the Army's RML truly an RMA?

Goals of the Revolution in Military Logistics

To understand Army logistics transformation to date, it is first necessary to examine its stated goals. In 1996, the Chairman of the Joint Chiefs of Staff published Joint Vision 2010, outlining his thoughts on how the U.S. military needed to prepare to meet challenges and adversaries in 2010. Joint Vision 2010 named key tenets required to achieve a level of full spectrum dominance over adversaries, and one of these tenets was focused logistics. The CSA published the corresponding Army Vision 2010 in 1997. This document defined focused logistics as "the fusion of information, logistics, and transportation technologies to provide rapid crisis response, to track and shift assets even while en route, and to deliver tailored logistics packages and sustainment directly at the strategic, operational, and tactical level of operations." At that time, the Army listed eight concepts that it would pursue in the development of focused logistics: anticipatory logistics and personnel support, split-based operations, sustained tempo, enhanced throughput operations, velocity management, battlefield distribution system, total asset visibility, and objective supply capability

As I have said many times, there can be no revolution in military affairs without having a revolution in military logistics. —General Dennis J. Reimer, Chief of Staff of the Army, 1995–1999

In 1997, the Joint Staff Logistics Directorate (J-4) published "Focused Logistics, the Joint Logistics Roadmap to Joint Vision 2010" as an addendum to Joint Vision 2010. This was an action plan for identifying and integrating joint logistics issues and initiatives. A key to this plan was the designation of six tenets, or areas of focus, as the framework for the logistics required to support joint warfighting: joint theater logistics command and control, joint deployment and rapid distribution, information fusion, multinational logistics, joint health services support, and agile infrastructure. Although concepts such as technological innovation and leveraging key enablers to achieve information superiority were referred to as something desired, the lack of specifics meant that this document served as a general direction of effort rather than a series of steps to achieve the end state described.

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An Army Revolution in Military Logistics?

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In 1999, the Army Deputy Chief of Staff for Logistics (the Army G-4), the Army Combined Arms Support Command (CASCOM) Commander, and the Commander of the Army Materiel Command published an article in the January–February issue of clearly laid out the way ahead for logistics transformation. For the first time, the Army's three senior logisticians addressed the logistics community in a unified voice. The CSA and the Commander of the Defense Logistics Agency wrote complimentary articles in the same issue of the magazine.

These articles identified the Army's focus areas for the next 10 years of transformation and designated them as the first wave of the RML. The Army's logistics transformation would focus on exploiting improvements in automation, communications, and business practices; reshaping command and control relationships to provide better unity of command; and purchasing distribution technologies that facilitated rapid throughput and follow-on sustainment. The second wave of logistics transformation, from 2010 and beyond, would focus on maximizing emerging technologies that could be used to lighten support requirements, enable those requirements to be projected faster, and reduce the overall demand for logistics as a whole. The Army also named the tenets needed to frame its efforts to achieve focused logistics: a seamless logistics system, distribution-based logistics, total asset visibility, agile infrastructure, rapid force projection, and an adequate logistics footprint.

The Army did not completely mirror the concept of focused logistics as defined by the Joint Vision 2010 addendum's six tenets. The Army neglected to include joint theater logistics command and control, multinational logistics, and joint health services support. This is significant as it reveals that the alignment of priorities at the Army and joint levels were not always synchronized. At right is a chronological order of the Army's published tenets or focus areas of RML and their links to joint doctrine.

Relating RML to DOTMLPF

The following is an analysis of the logistics-related changes made to doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) since the establishment of the RML in 1999. The question is whether these changes are revolutionary or evolutionary.

Doctrine. The changes to doctrine have been evolutionary in nature. The Army learned lessons from the characteristics and functions of combat service support (CSS) doctrine. It recognized the requirement to operate as part of a coalition and addressed joint and multinational support in its doctrine. The Army also changed its field manual numbering system to mirror the joint doctrine numbering system. It realized that successful logistics support of an operation cannot be

left in the hands of capable individuals unless they have the appropriate resources. Finally, the Army realized that logistics is broad in scope and simplified its doctrine at the tactical level accordingly. These changes all mark a natural and logical progression.

Organization. The very basis of the Army's transformation causes a revolutionary shift in the logistics organization structures. The key to the transformation is the shift from a division-centric force, focused on the employment of 10 divisions, to a brigade-centric force, focused on the employment of 70 brigades, including 42 active component and 28 reserve component brigades. It has taken what used to be an organization formed only for deployment, the brigade combat team (BCT), and made it a permanent, fixed organization. However, it has done the polar opposite with logistics units, eliminating most fixed structures above the brigade support battalion (BSB) level, particularly at the division level. While joint force commanders can select from a fixed menu at the brigade level, they have to order logistics a la carte. This seems like a logical way to support forces with a more capable BSB, and it may seem evolutionary in nature. However, making the leap to multifunctional logistics down to the company level and relying on the ability of logistics organizations to form to meet a specific mission set and deploy in a relatively short period of time requires revolutionary thought and quite a bit of faith.

Training. Training has experienced four fundamental changes, and they are essentially evolutionary. First, company- and field-grade logistics officers are benefiting from four initiatives to increase their operational competence. The first is the creation of the Basic Officer Leadership Course. The second initiative is the decision to allow CSS officers to attend the 61-day the first two initiatives is that more tactically proficient officers will now be leading soldiers into combat. The third officer initiative is the decision to send all majors in the Operations Career Field (predominantly working in deployable units) to the year-long Intermediate Level Education (ILE) course at the Army Command and General Staff College at Fort Leavenworth, Kansas. In the past, only 50 percent of majors in the Army were allowed to attend the resident phase of this school. The fourth officer initiative is the creation of a multifunctional logistician functional area.

A second fundamental change in training is the change to the Army's standards in weapons training. Now, CSS units are required to perform live fire training and are given the resources to do so as much as combat arms units. That change means that CSS units, already led by more tactically proficient leaders, are now entering combat with better training at the individual and collective levels.

A third fundamental change in training is the emphasis by CASCOM and the Army Training and Doctrine Command on producing tactics, techniques, and procedures to conduct convoy and base defense live fires.

Finally, the Army is also building facilities at all three combined training centers for conducting convoy and

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SOLE Information

SOLE-The International Society of Logistics is a nonprofit professional society composed of individuals devoted to enhancing logistics technology, education, and management. For further information on SOLE or this chapter, contact any of the individuals listed on the front page of this newsletter.

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base defense training events, which are vital to the execution of logistics

To call this focus in training revolutionary would be wrong. It appears more like a reaction to the Army's current operations. Perhaps the revolutionary aspect is that the Army is not only retaining but also expanding its institutional training as it continues to execute the Global War on Terrorism. However, note the absence of any significant training initiatives specific to non-commissioned officers or enlisted personnel.

Materiel. Two significant changes to materiel for the Army have affected the RML. The first is the change in the Army's acquisition process, and the second is the Army's expectations for unit readiness. Two outstanding programs that epitomize the acquisition process improvements are the Rapid Fielding Initiative and the Rapid Equipping Force. In October 2005, the Army also introduced what it calls the Army Force Generation model for manning, equipping, and training units. Rather than being tied to static units, now units are given priorities based on the likelihood that they will deploy. As impressive as these changes in materiel solutions are, they are merely evolutionary improvements, not revolutionary. They are simply enhancements to increase visibility, reduce response time, and ensure unit readiness.

Leadership and Education.

Part of the Army's overarching RMA is a movement from a division-centric Army to a brigade-centric Army. While this, again, is not a new concept (regimental combat teams fought regularly in World War II), it does mean that brigade commanders now have more responsibility and thus require more assets. Now that the division support command (DISCOM) no longer exists, the BCT is the first organization in which a logistician works for a warfighter. Support battalions that used to report to a DISCOM commander now report to the supported brigade commander.

The Army has given complete control of logistics to the supported brigade, focusing on customer satisfaction at the brigade level. In contrast to this, the next level in which a logistician will typically work for a warfighter is at the Army Forces level (a and or higher). With the focus on brigade-sized organizations and division- and corps-sized headquarters commanding them, sustainment brigades do not report to those warfighting commands. Instead, they report to the theater sustainment command (TSC) in theater. Although this may seem like a departure from the brigade-level focus, it actually gives the TSC commander the ability to flex assets across the battlefield to support the maneuver plan.

The only reason this represents a revolutionary change is that aligning all logistics organizations under a single logistician in a theater is the opposite of placing the BSB commander under the control of the BCT commander. The bottom line is that this supports centralized control (TSC and BCT commanders) and decentralized execution (sustainment brigades and forward support companies). What makes it revolutionary is that the Army could have picked any level at which to centralize command and control, and it selected the lowest and highest echelons.

Personnel. Although the concept predates the RML, because of the time necessary to realize the effects of the change, creation of the multifunctional logistician is perhaps the most revolutionary change. The multifunctional logistician (functional area 90) is competent in planning and directing logistics operations from the factory to the foxhole, across the entire spectrum of logistics functions. The multifunctional logistician must have experience in synchronizing and integrating the functions of supply and services, transportation, maintenance, aviation logistics, and medical service. In a time when the Army is rapidly fielding and equipping units with highly technical materiel solutions, it is demanding that its personnel become more generalists than specialists. One could argue that this is really being forced on the Army based on its current operating tempo. By creating a multibranch Logistics Corps, the Army is essentially stating that it has provided the resources and trusts that its quality personnel, provided with first-class training, can execute all of the logistics functions adequately. This is a significant change to branch parochialism.

Facilities. There has been only one significant change to facilities that affects logistics transformation. This change, like others mentioned, is inexorably linked to other DOTMLPF domains, like training and personnel. As a result of the 2005 Base Realignment and Closure Commission's report, the Ordnance Center and School at Aberdeen Proving Ground, Maryland, and the Transportation Center and School at Fort Eustis, Virginia, will relocate to Fort Lee, Virginia. There, they will merge with CASCOM, the Quartermaster Center and School, and the Army Logistics Management College to form the Army's Sustainment Center of Excellence. This will, for the most part, consolidate logistics training and doctrine development at one installation. While this change is linked to a revolutionary process, the need to consolidate installations is really an evolutionary response to the new Logistics Corps, coupled with the consolidation of officer training, and is based on the need to reduce redundancy in combat developments and training.

Without a transformation in logistics, there will be no transformation in the Army.
—General Eric K. Shinseki,
Chief of Staff of the Army, 1999–2003

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By applying the DOTMLPF domains to specific changes the Army has made since 1999 to its logistics construct, three were determined to have made revolutionary changes and four were not. With all of the aspects weighted equally, the answer is simply no: the Army has not revolutionized logistics to date.

Analyzing Logistics Changes Based on RMA

After qualitative analysis of the RML in relation to each of the seven DOTMLPF domains, it is logical to look at the overall changes to Army logistics and analyze them according to the innovations required for an RMA. The four innovations—tactical, doctrinal, organizational, and technological—required for an RMA will be discussed to determine if they reach a different conclusion than the DOTMLPF analysis.

First, tactical innovations are conspicuously absent during the RML's time period. Tactical logistics is performed in essentially the same manner now as in 1999. Combat forces are supported by an echelon of logistics that requires stocks of supplies and distribution assets. That echelon of logistics is supported by another echelon that accomplishes the same mission on a broader scale. Although the Army is attempting to streamline this process through materiel solutions (technological innovations) and organizational changes, the process remains the same.

Doctrinal innovations, albeit not revolutionary in nature, have occurred. The Army has learned from its past lessons and made appropriate adjustments to its doctrine. However, the doctrine, which is broad in nature, has not generally changed the way logistics is conducted in support of operations. Any revolutionary change will likely come from organizational and technical innovations. Organizational innovations have occurred and have already been deemed revolutionary. First, the Army now has only three echelons of logistics, whereas previously it had at least five. Second, the organization supporting the BCT has become more capable. Third, the decision to create organizations capable of task organizing to meet a specific mission and placing them under the control of a single commander gives logisticians greater flexibility than ever before.

Finally, technological innovations seem to be one of the areas in which the Army will make great strides in achieving its RML. In addition to systems such as the Battle Command Sustainment Support System (BCS3), the Army is developing systems that will improve distribution on a three-dimensional battlefield: Joint Precision Airdrop System (JPADS) and joint heavy-lift aircraft, which will allow more efficient distribution of fuel and water; the theater support vessel, which will enable quicker deployment of forces; and the armored security vehicle, which will permit logistics units to protect themselves. Although innovations have occurred with varying degrees of success, there has been no fundamental change to the way logistics is conducted. However, that being said, the Army has accomplished an enormous amount since 1999 in improving its logistics

capabilities.

The Army's Report Card

How do logistics changes made thus far stack up against the tenets of the RML? In 2004, the Army stated years: a Logistics data network, a responsive distribution system, a robust modular force reception capability, and an integrated supply chain.

Logistics data network. The Army's intent was for logisticians to be an integral part of a joint, satellite-based communications network that is capable of providing full-time connectivity from the battlefield to the industrial base. Implementation of BCS3, which will be fielded to all active duty units by the end of fiscal year 2007, will make great strides towards achieving this tenet if it provides everything it promises. However, two key hurdles need to be overcome for this tenet to be realized. First, BCS3 needs to provide not only in-transit visibility but also total asset visibility. Second, BCS3 needs to be able to provide the appropriate level of asset visibility continuously to everyone in the logistics chain, from the operator of a truck to the TSC commander. Without that capability, it will be impossible to achieve a responsive distribution system.

Responsive distribution system. The Army's intent was to develop a distribution-based logistics system, reaching from the source of support to the Soldier, focused on guaranteeing on-time delivery. The Army has taken steps required to achieve this tenet by providing resources for its organizations. Distribution exists at the brigade level, and sustainment brigades can task organize distribution assets to meet requirements. Distribution must now focus on two things: seamless integration with the capabilities of the other services and the use of ethnological innovations to mitigate the risk associated with time and distance on the battlefield. BCS3 must provide in-transit and total asset visibility in real time. This will allow commanders to adjust resupply operations while en route, determine supply and maintenance requirements and act appropriately before the critical time, and make the current distribution system truly responsive.

Robust modular force reception capability. The Army's intent was to design an integrated theater-opening capability that responds on extremely short notice and executes crucial sustainment tasks immediately upon arrival in theater. Two specific changes in the Army's organizational structure have been made to achieve this capability. The first is the creation of the expeditionary sustainment command, which can deploy rapidly and provide command and control of a theater logistics network indefinitely or until relieved by a TSC. The second is the identification of a sustainment brigade (theater opening). Although, as mentioned previously, sustainment brigades are not fixed organizations, the Army has identified the resources required for a theater-opening capability and embedded them into emerging doctrine as a template for an organization to meet this requirement.

Integrated supply chain. The Army's intent was to develop an end-to-end view of the supply chain and integrate service and agency processes, information,

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and responsibilities by providing joint logistics data freely and automatically among the strategic, operational, and tactical levels. Progress in this tenet still suffers from parochialism in the military. End-to-end distribution requires the collective efforts of all services; however, the services still have issues regarding interoperability, culture, and communications. The development of joint systems such as BCS3, JPADS, and joint heavy-lift aircraft is helping to mitigate this problem. Another innovation that may help realize this issue is the development of a Joint Logistics Corps.

Logistics transformation is critical as the Army adapts to the new realities.

—General Peter J. Schoomaker,
Chief of Staff of the Army, 2003–2007

The Army is not in the midst of a revolution in military logistics. Although the Army has revolutionized specific processes, logistics transformation generally has been characterized by one of three terms: logistics evolution, logistics reaction, or logistics adaptation. Logistics evolution is a gradual process in which something changes into a different and usually more complex or better form by recognizing shortfalls and evolving to overcome them. Logistics reaction is a change in response to immediate and significant requirements, such as the Global War on Terrorism. Finally, logistics adaptation is recognizing better procedures that are being used by sister services or commercial businesses and applying them to Army systems. Since the Goldwater-Nichols Department of Defense Reorganization Act of 1986, the services have been actively pursuing better cooperation with each other. Successful operations in the Persian Gulf and the Balkans are testaments to the effort. In achieving that goal, perhaps logistics can be truly revolutionized, which may ultimately lead to a revolution in multinational logistics. **ALOG**

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Book Review:

Alexander the Great and the Logistics of the Macedonian Army (Paperback)

by [Donald W. Engels](#)

(Reprinted from AMAZON.COM Review)

Readers found this book insightful and groundbreaking scholarly monograph, March 8, 2001

By [Mike Baum](#)

Imagine this:

You're Alexander the Great, setting out on campaign with your mighty army. Glory and profit await you if you succeed, and as you know from history, the real Alexander did succeed. His army was renowned for its efficiency, speed and lethality; his expedition through Asia was the longest military campaign ever undertaken; he fascinates military historians to this day.

But when you put yourself in his place, ask yourself what was required of Alexander to realize his achievement. Was his fame won through superior force of men and arms alone? Could he take his army anywhere he desired, at any time? Had he merely to set his stern, clear gaze upon a point on the horizon and say: "There we shall go"--or was there more to it?

Start with a mundane consideration: how do you feed your men? It's not as clear-cut as it might seem. Suppose you have an army of 10,000 men. Suppose, further, that each man's consumption rate is 3 pounds of grain per day's march. Now realize that this must mean just what the numbers tell you: each man of your 10,000 needs 3 pounds of grain daily, 3 times 10,000 is 30,000--so you need an incredible 30,000 pounds of food, each and every day. If you don't get this food, your men will weaken and die. There's no way around it.

Book Review: Alexander the Great and the Logistics of the Macedonian Army (Paperback) (CONT'D)

A quarter million pounds of food over the course of a week's march isn't easy to come by, especially in Alexander's day, is it? After all, you can't have the food airlifted to you. You have no motorized vehicles to speed you along, either, bear in mind. Your own feet must take you, slowly and over rough terrain in hot weather, to your destination. If and when you reach and conquer a town, its food stores become yours; but such settlements are few and far between, and practice subsistence level agriculture, in any case. Do your men carry all their food provisions with them? Food isn't all that your men must carry, and a man's back can only bear so much. Do you use pack animals? They have their own food requirements, which are greater than a man's, and in less time than you'd think they will eat what they haul.

The fact is that waging war is never merely about raising an army and fighting an enemy; it's also about getting to the enemy without dying of dehydration and malnourishment along the way. How Alexander surmounted such problems of logistics--the supplying and transporting of his army--is the subject of Engels's fine book. With rigorous scholarship, utilizing sources both ancient and modern, including the most recent geographical and archaeological data, Engels shows that logistical concerns conditioned Alexander's every choice of strategy and tactics, timing and direction, necessitating the most careful, long-range planning. As Engels states, "a military route is not a mere line drawn on a map but a narrow corridor with sufficient agricultural and water resources in the immediate vicinity with which large numbers of men and animals can be supported." This is a fact of military planning of which Alexander had to be constantly aware. Engels does an excellent job in explaining it, and makes the subject of logistics much more interesting than I would have thought possible. This book is a much-needed corrective to earlier studies of Alexander the Great that oversimplify this aspect of his generalship of the Macedonian army.

Logistics Quotes:

(Reprinted from WWW.VirtualLibrary.com)

Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act; logistics brings the troops to this point. - General Antoine Henri Jomini, *Precis de l'Art de la Guerre (The Art of War)*, 1838

Logistics...as vital to military success as daily food is to daily work. - Captain A.T. Mahan, *Armaments and Arbitration*, 1912

The essence of flexibility is in the mind of the commander; the substance of flexibility is in logistics. - Rear Admiral Henry Eccles, U.S. Navy

The tactics...no, amateurs discuss tactics,.. Professional soldiers study logistics. - Tom Clancy, *Red Storm Rising*