STRATEGY RESEARCH PROJECT

TRANSPORTATION OF SUSTAINMENT CARGO: IS THERE A NEED FOR A DOD DISTRIBUTION AUTOMATED INFORMATION SYSTEM?

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ABSTRACT

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This is an analysis of the distribution of the sustainment cargo. The paper supports the position that change is needed to consolidate the strategic level transportation Standard Army Management Information Systems and supporting databases in order to have a seamless system between the strategic and operational level. The strategic guidance for logistics information is clear: accurate and timely logistics information is needed to meet the challenge of deployment of tailorable packages and providing support within hours and days of notification. The paper offers two recommendations to solve the problems in intransit visibility of cargo. The first recommendation is the development of a DoD distribution STAMIS for the tracking of sustainment. The second recommendation is the outsourcing of the sustainment transportation functions to a premium transportation company such as United Parcel Service, or DHL.

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TRANSPORTATION OF SUSTAINMENT CARGO: IS THERE A NEED FOR A DOD DISTRIBUTION AUTOMATED INFORMATION SYSTEM?

On 12 October 1999, General Eric Shinseki, Chief of Staff of the Army, delivered a speech to the Association of the United States Army convention in Washington D.C., in which he stated his vision for the Army in 2010.[1] This vision would cut back on logistics units by as much as 90%, requiring a greater reliance on strategic reach back capabilities. Our forces will be required to deploy faster with leaner logistics capabilities. Reliance on accurate and timely information will assure the flow of critical supplies from the strategic to the operational and tactical levels. This paper will focus on the problems, challenges, and recommendations relating to the movement of sustainment cargo from the strategic to the tactical. The need for real time logistics information will be critical in meeting the vision contained in the National Military Strategy. Logistics information technology, expertise, and time will be amongst the most critical factors and will determine, in part, the efficacy of logistics organizations in supporting the nation's varied contingencies.

Today, we are still faced with the problems of providing timely information at the strategic level. There are several reasons for these problems. First, there is no central strategy at either DoD or the Army to integrate the development of numerous initiatives relating to logistics information management. The result has been employment of stovepipe information systems that are not interconnected.[2] This shortfall, which starts at the strategic level, has a direct impact on readiness because of the inability or inefficiency in planning in all of the logistics functions: arm, fuel, fix, man, move, and supply. Second, there is a lack of discipline in the distribution of critical supplies and there is no overall DoD watchdog to police and discipline the system. Third, we have not modernized the DoD movement procedures for over 40 years. The impact is that there are no existing procedures for many of the transportation challenges that exist today. Finally, strategic logistics is comprised of many joint and service logistics commands, each with distinct cultures and operational procedures. There are chapters in this paper to address these issues in depth and offer recommendations to support the National Military Strategy.

During contingencies, cargo often arrives at the destination faster than the logistics information, which results either in delays in delivery or non-deliveries. All of these problems have a direct impact in obtaining accurate logistics information quickly, which directly affects the outcome of ongoing deployments, employments and the overall readiness of the combat force. The aforementioned problems have been observed in recent operations ranging from Operation Desert Storm to the deployment of Task Force Hawk to Albania. In the deployment of Task Force Hawk, the theater level logistics organizations directed that all of the critical supplies be sent from CONUS to Kaiserslautern, Germany for further handling and onward transport to Albania. USAREUR leaders took this action in order to control the airflow into Tirana, Albania and to have visibility and control of the parts from CONUS. To establish Task Force Hawk (a force consisting of 5000 personnel, helicopters, multiple rocket launcher systems) the

theater and corps materiel management centers and the movement control organizations operated around the clock and still had difficulty in obtaining accurate information to track sustainment operations.[3] The tracking of critical parts and supplies was done by telephone to CONUS and through the limited use of Automated Information Technology tag databases and logistics information systems databases. Because the intransit visibility of sustainment was obtained from information derived by 20 separate automated information systems, information synchronization was difficult due to varying formats, standards for submission, variety of databases and the handoff of information among databases.[4]

In the deployment of Task Force Hawk, the need for accurate logistics information could not keep pace with the deployment. By design, a corps support command would support three to five divisions of 75,000-100,000 personnel.[5] Yet, the level of effort in obtaining accurate data in a timely manner diminished the capabilities of the theater level logistics organizations. The system won't be able to meet the challenges posed in the National Military Strategy, which consists of providing support to rapidly deploying tailorable forces on a short notice. The logistics challenges are further exacerbated by the competing strategic mobility requirements of deployments and sustainment.

It is time now for DoD to address these issues with plans and procedures that will include procedures and standardized hardware for intransit visibility, development of information systems that will meet the logistics needs for the commanders in the entire spectrum of conflict, and a modernization of distribution processes to meet the challenges of today.

Focused logistics will require focused information, which will be a product of modernized information systems, discipline, and modern procedures to meet the demands of deploying tailorable forces at short notice.[6]

STRATEGIC GUIDANCE

The Joint and Army level guidance gives a clear end state for the capabilities required for intransit visibility and its importance in meeting rapid deployment of forces anywhere in the world. The National Military Strategy envisions a force projection capability of tailorable deployment packages to meet the numerous contingencies of this nation. New operational doctrine to enable this capable military force will include dominant maneuver, precision engagement, focused logistics, and full dimension protection. Focused logistics entails support to tailorable force packages immediately upon notification for deployment. Units will deploy with lean basic loads and will rely on the accuracy of logistics information to provide responsive logistics support during deployment and employment. The key will be to leverage information, transportation, and logistics technologies to ensure movement prioritization of units, equipment, and critical supplies.[7]

The National Military Strategy emphasizes that joint sustainment initiatives such as the Joint Total Asset Visibility (JTAV), and the Global Transportation Network (GTN), and the Global Combat Support

System (GCSS) are deployable systems that are used at the strategic, operational and tactical levels to provide intransit visibility, eliminate redundancies, and unnecessary delays in the movement of critical supplies through the logistics system. Intransit visibility will be a critical component to ensure focused logistics. Focused logistics will be a key in peacetime readiness and the transition to war (e.g., deployment and employment).[8] The requirement to meet the immediate logistical needs of tailorable deployable packages underscores the importance of intransit visibility in meeting the National Military Strategy.

Joint Vision 2010 defines focused logistics as the "fusion of information, logistics and information technologies to provide rapid crises response. To track and shift assets even while enroute, and to deliver tailorable logistics packages and sustainment directly to the strategic, operational, and tactical levels of operation. The system will have to meet the needs of the increasingly dispersed and mobile forces, providing support in hours and days rather in weeks".[9] The DOD Logistics Strategic Plan emphasizes that "logistics information will be a primary commodity of the logistics system". The DoD plan predicts that as the information explosion accelerate the need for integration of information systems will be greater and processes will be more automated.[10]

Army Vision 2010 mirrors the focused logistics guidance set forth in JV 2010 and characterizes the applicable operational concept across the spectrum of conflict.[11] The Army's Strategic Logistics Plan is the Chief of Staff's vehicle to guide Army Logistics through the 21st Century. The Army plan clearly delineates objectives that relate to the distribution of sustainment from the strategic to the tactical. These objectives are to:[12]

- Create a seamless single logistics system for the 21st century and beyond;
- Standardize operating practices and supporting automation and communications architecture;
- Establish visibility of stocks in transit and in storage; and
- Develop and implement an integrated distribution system.

A central theme in the strategic guidance is the need for quality and timely information that starts at the strategic level though the operational and the tactical. The expected reach back capabilities make reliable logistics information an imperative to responsive and continuous logistics support.[13]

General Shinseki's AUSA speech on 12 October 1999 emphasized cuts in the logistics force structure at the operational and tactical levels.[14] All of the strategic guidance emphasizes that focused logistics must flow seamlessly from the strategic to the tactical. The implication of the force structure cuts and the need for focused logistics are that the strategic logistics organizations will have an even greater responsibility in providing accurate real time logistics information to support the operational and tactical level.

CONTINGENCY OPERATIONS

OPERATIONS DESERT SHIELD AND DESERT STORM

Operations Desert Shield and Desert Storm renewed a long-standing problem of intransit visibility. During Desert Shield, thousands of containers were discharged at the port of Ad-Dammam and Al Jubayl, Saudi Arabia with incomplete or no documentation. Port operators established teams devoted to opening containers to account for the type of supplies contained therein. The quantity of containers awaiting onward movement at the ports often surpassed 5000. Operation Desert Shield and Storm exposed problems in documentation discipline and the lack of integrated logistics STAMIS and communications capability to enable distribution of critical supplies from the strategic to the forward line units. Even when these systems existed, they were not effective in transmitting information to other parts of the logistics systems. While Desert Storm was an overwhelming success, the logistics capability established in Southwest Asia was the product of the determination of logistics leaders (using World War II methods) at all levels, and the time available to build up forces and sustainment, but it also exposed significant intransit visibility problems. The intransit visibility issues for sustainment were in two distinct areas: the need for technology (both in hardware and software), and the need for discipline in distribution of sustainment cargo.[15]

BOSNIA:

During Operation Joint Endeavor and Guard (OJE and OJG respectively), most of the sustainment cargo arrived through the seaports of Rotterdam, the Netherlands, and Bremerhaven, Germany. During the initial stages of OJE, approximately 2000 containers arrived monthly destined for units in Hungary and Bosnia. Most shipments had poor documentation, and hence it was difficult to determine the detailed contents of the containers. U.S. Depots were sending cargo with Transportation Control and Movements Document (TCMD) labeled as GENNOS or "general cargo not otherwise specified". Depots indicated that their documentation complied with DoD movement procedures when, in fact, they had a responsibility to provide detailed contents information. Not knowing the contents of a container hindered anticipatory logistics and resulted in unnecessary delays at the ports and depots. Other problems resulting from poor documentation were the lack of information needed for planning the materiel handling equipment requirements, hazardous cargo handling and onward movement.

For this reason, during Operation Joint Endeavor (OJE), the U.S. Army Europe, Deputy Chief of Staff for Logistics and the Commander, 21st Support Command directed that many of these shipments be sent to Kaiserslautern Army Depot, Germany for sorting, repackaging and onward movement to the

Balkans. This added step detracted from throughput to the area of operations. This action also showed that senior leaders had a lack of confidence in distribution from the strategic to the operational.[16]

What has been observed in recent operations is that transportation, supply, and maintenance stovepipe systems provide an overload of poor quality and late information that impairs the ability of logistics planners to distribute sustainment effectively from the POD to the ultimate user.

CURRENT SYSTEMS

From 1992 to the present TRADOC Combined Arms Support Command (CASCOM), and Department of the Army Deputy Chief of Staff of Logistics (DA DCSLOG) have developed Standard Army Management Information Systems (STAMIS) in an effort to improve ITV and TAV. These Standard Army Management Information Systems were developed vertically by the logistics schools and were not interconnected. The lack of inter connectivity among the STAMIS performing the logistics functions move, arm, supply, sustain, fix, and man makes retrieval of real time or near real time information difficult or untenable.[17] The irony in the development of the STAMIS is that the standards were established within a functional area but there were no standards established across the other functional areas under the materiel management. As a result, materiel management ranges from difficult to non-existent due to the lack of STAMIS interconnectivity. In the development of these STAMIS there was not a centralized plan to deal with the information interchange, formats or protocols with respect to use of databases. Another reason for disconnects are the limited lines of responsibility for the development of these STAMIS. For example, CASCOM has responsibility for the development of STAMIS at the operational and tactical levels. Strategic levels STAMIS are developed by Army Materiel Command, USTRANSCOM subordinate commands and the sister services. Since Desert Storm, there have been some innovations to address the problems of intransit visibility. The rest of this section will describe these development and the capabilities and limitations of these systems.

The Automated Identification Technology (AIT) tags were first tested during Joint Logistics Over the Shore Operations (JLOTS) at Fort Story Virginia in 1992. The proof of principle illustrated effective tracking of cargo throughout the logistics pipeline. AIT tags are battery-operated instruments capable of receiving, storing, and transferring shipment data. Tags are affixed to cargo during shipment. Input to the tags is done either manually or electronically through labels, similar to those seen in consumer products. Examples of data inputs include description of the item(s), quantity, cube, weight, UIC, and DoDAAC. While intransit, AIT tags transmit data to Radio Frequency interrogators positioned in key nodes and links. Data from the interrogators is then transferred via satellite to a central databases as is currently used in

LOGSA, Alabama. Users can access via the internet the current location of the cargo through a central or regional database.[18]

The Military Traffic Management Command developed and implemented the Worldwide Port System (WPS) at its 25 ocean terminals. The main advantage that WPS has over its preceding systems is the ability to provide advanced information to plan for onward movement and reception of cargo. WPS provides cargo manifesting, hazardous cargo documentation, and the Transportation Control and Movement Document. WPS provides cargo manifest information to the U.S. TRANSCOM Global Transportation Network and the Logistics Intelligence File for users to be able to track cargo through the Defense Transportation System. WPS replaced four disparate STAMIS used during ODS.[19]

During June 1996, MTMC directed an AIT test that tracked containers from Anniston Army Depot to Sunny Point, North Carolina, then to Bremerhaven, and to its ultimate destination at Miesau Army Depot, Germany. This test proved successful because all containers with AIT tags were tracked through these nodes using pre-positioned repeaters. The data was sent to the Logistics Support Activity (LOGSA) database in Alabama via satellite for access and used by all logisticians in the European theater and the strategic level. The ITV data obtained included detailed contents of the container, location of shipment, RDD, shipper's information, transportation control numbers and requisition numbers. Following this test, AIT was effectively used to establish the Air Lines of Communications (ALOCs) in the Balkans.[20]

Today, the dilemma in logistics automation is that the AIT and the STAMIS are not formally connected. Examples of STAMIS that need inter connectivity with AIT are Standard Retail Supply System (SARSS), Standard Army Maintenance System (SAMS), Standard Army Ammunition System (SAAS) and Department of the Army Materiel Movement System- Redesign (DAMMS-R). These STAMIS cover the supply, arm, fix, and move functions. These interconnectivity problems result in the expenditure of vast amounts of critical time during unit deployments, and employment to determine supply status in the logistics system. The results of the lack of interconnectivity cause delays in delivery or non-delivery of cargo. The data entry requirements for one piece of cargo in WPS, or Consolidated Aerial Port System (CAPS II is the Air Mobility Command cargo accounting and manifesting system), and the LOGSA database are different due to the input the shippers provide for each of these systems. In some cases, the cargo arrives at the destination without prior notification due to the inefficiency of database interchange. Evidence of this was clear during the recent deployment of Task Force Hawk from Central Europe to Albania. Tracking of critical supplies involved every logistician in Europe and many of the senior USAREUR leadership.[21]

Currently, the Worldwide Port System can provide information to the Department of the Army Materiel Movement System-Redesign. However, DAMMS-R uses a theater database different from GTN. Consequently, the tactical logistician is faced with the challenge of retrieving data from numerous databases for the same piece of cargo. This is a very inefficient system for all logisticians. Hence the

cargo tracking system can be broken making it very difficult for logistics units to track cargo. At the tactical and the operational level, the logistics units involved in tracking sustainment cargo include the Materiel Management Centers, Movement Control Battalions, and the Direct Support maintenance units.

The recent rapid deployments underscore the importance of real time logistics information necessary to provide critical supplies and equipment to units. Some advances have been made since Desert Storm to improve intransit visibility. Our need to provide real information continues to increase with the deployment of task forces and exacerbates the challenge of split based units.[22] Split based units will have information needs to support the split based operations. In addition, split based units will depend on ITV to differentiate and direct movement of the supplies for the forward deployed unit(s) and the rear detachment. This challenging task must start at the strategic level and be guided by both the strategic and operational levels to the intended destination whether at a forward deployed location or in garrison.

TRACKING OF CARGO TODAY:

Tracking of cargo today is done via the Logistics Intelligence File (LIF). The strategic supply system has established twelve steps to document or track the cargo from the time an item is requested to the receipt of the item by the requesting unit. The LIF sends updates to the requesting unit to advise of the status of the requisition in the logistics pipeline. The following are the steps in the LIF cycle.

1. Document Date: The user sends a request to the installation/retail level. The installation/retail sends the request via Standard Army Retail Supply System (SARSS) to the wholesale level.[23]
2. The LIF is established at the wholesale level.[24]
3. The National Inventory Control Point cuts an MRO.[25] Location status is annotated in LIF.
4. The depot ships the item to a Consolidated Container Point (CCP).[26] Location status is annotated in LIF.
5. The CCP receives the shipment and prepares the item for overseas shipment.[27] The CCP books the item either through MTMC, AMC or premium air. At this point the CCP sends advanced TCMD data to the APOE or SPOD. Location status is annotated in LIF.
6. CCP sends the shipment to the POE.[28] Location status is annotated in the LIF.
7. The POE receives the shipment and prepares a manifest.[29] Location status is sent to LIF.
8. POE ships cargo to POD.[30]
    a. Sea: In sea movement, WPS creates a manifest, which will include the data provided by the CCP. This data includes the Transportation Control Number (TCN) and the requisition number, description of the item, the quantity and the UIC of the unit. A TCN can contain a variety of items destined to many units. After the ship departs,

the manifest is sent electronically to one of the MTMC databases and to the LIF. LIF takes the information and updates the status of the requisition. The issue is that batching can occur in the transfer and the information is not always exportable from one system to the other due to formats and incomplete information.

b. Air: In air movements, the CAP II creates a manifest and sends the data the GTN. The speed of air travel is such that cargo moves faster than the ability to provide updated data from the CAPS II databases to the LIF. The problem is further exacerbated if the information is not complete such as the detailed contents of the container or pallet.

9. POD receives the cargo from the POE.[31] WPS and CAPS II have the capability to send electronic acknowledgement that the POD has received the items.
10. POD sends the cargo to the ultimate user.[32] The Movement Control Battalion accesses the manifests through the MTMC regional database and plans for the onward movement of the cargo to the user or to a theater distribution center, if applicable. The Department of the Army Materiel Management System-Redesign is the operational level STAMIS used for planning and execution of convoys for cargo. The handoff between the port and the movement control functions is done mostly via person and not via electronic means. There is no clean or system handoff between the WPS and DAMMS-R databases to handle the materiel management function of this intermodal transition. Often the cargo travels faster than the ability to update the LIF. In reality, user units start the tracing of cargo at the NICP and work their way through the system because they cannot rely on the accuracy and timeliness of the data sent to LIF.
11. Theater Distribution Center (TDC): TDC is a distribution center for the theater.[33] In the case of Germany, the TDC is in Kaiserslautern, Germany. The TDC in Kaiserslautern has developed an in-house system to account for the cargo but it is not compatible with other systems, which results in the loss of visibility in LIF. The cargo must be physically at the TDC for verification.
12. DSU: The item arrives at a supply support activity or Direct Support Unit for distribution to the unit. The cargo is shipped to the unit.[34]

The above twelve-step process is our current system for tracking cargo. The complexity of data interchange is shown above to demonstrate the inefficiency in data transfer from the strategic to the unit. Our current system is far from seamless because the data interchange is interrupted, late or incomplete. The contributors to these problems are the numerous databases that feed LIF, the factor of synchronization in the timing of these databases, the difference in formats and the lack of technical

integration. The speed of current operations and the aforementioned problems in our current tracking procedures are driving many of the strategic agencies (AMC) to consolidate databases and STAMIS.

CURRENT PLANS

The National Military Strategy emphasizes the deployment of tailorable packages and implies the concomitant need to provide responsive and continuous support to these tailorable packages. Logistics units force structure to support the 2010 strategy will require deployability in modular units able to establish and sustain logistics within hours and days.

The Army's system for tracking sustainment and for deployment will be Transportation Coordinators Automated Information for Movements Systems II (TC AIMS II). The Combined Arms Support Command white paper dated July 99, intends for TC AIMS II to be a joint STAMIS for the planning and execution of transportation from the strategic to the tactical. TC AIMS II will link Automated Identification Technology tags in many of the critical transportation nodes in the deployment and sustainment infrastructure. TC AIMS II will use the Global Transportation Network and other regional databases to provide Total Asset Visibility databases. TC-AIMS will replace the TC-ACCIS and DAMMS-R functions. TC-ACCIS is the STAMIS used by units to input Authorized Unit Equipment List and Deployment Equipment Lists used for deployment purposes. Units will now use a computer to input into the Joint Operational Planning and Execution System rather providing the input to a movement control center. DAMMS-R is used by the operational and tactical level Movement Control Battalions to plan for the onward movement of units and supplies via common user transportation assets. The simplicity of having these functions in one STAMIS will greatly increase the efficiency of the users and facilitate the management of change associated with deployment of tailorable units[35].

In essence, TC AIMS II has consolidated JOPES and movement control functions at the operational and tactical level. Under the current plan, TC AIMS II will have several projected interfaces with other critical STAMIS, which are at the strategic level. Some of these interfaces are listed below:

1) Mobilization Movement Control System: Used by the Reserve Component for convoy planning.[36]

2) The Conus Freight Management System: Used by Installation Transportation Officer to manage commercial freight services.[37]

3) The Computerized Movement Planning and Status System: A Department of the Army system used to update the Joint Operation Planning and Execution System (JOPES).[38]

4) The Automated Air Load Planning System: A computerized air load planner used by the Air Mobility Command to produce air load plans and manifests.[39]

5) The Global Transportation Network: A command and control information system used by US Transportation Command to integrate transportation data used in planning and intransit visibility.[40]

6) The Worldwide Port System: Computerized system used by MTMC for documenting, accounting and manifesting of cargo transiting DOD common user water terminals.[41]

7) The Combat Service Support Control Systems: CSSCS is designed to provide units situational awareness about transportation network, rails and bridges.[42]

8) The Integrated Booking System: Computerized system that allows direct requests of booking ocean cargo with MTMC.[43]

9) Distribution Standard System: Access to DLA database for transportation performance data.[44]

10) Standard Installation/Division Personnel System/Tactical Personnel (SIDPERS/TPS).[45]

11) The Global Transportation Network Host: Used at the operational and tactical level to obtain ITV data about units, forces, passengers cargo, patients, schedules, and actual movements.[46]

12) Financial Air Clearance Transportation System.[47]

13) Consolidated Aerial Port System II; Computerized system used by the Air Mobility Command to manifest cargo.[48]

14) The Global Combat Support System (GCSS-Army): GCSS -Army is a multifunctional STAMIS that will integrate six modules. User units will use GCSS-Army to manage maintenance, supply property, management, integrated materiel management module.[49]

Will TC AIMS II meet the needs for distribution of sustainment cargo for the future? The capability of including the deployment and onward movement functions will simplify units' input into JOPES and the movement control organizations from the strategic to the tactical. TC AIMS II has in effect embedded some of the JOPES and movements control functions into one usable STAMIS. However, TC AIMS II will not solve the sustainment distribution problems of the future. What is omitted is the integration of 14 strategic level STAMIS that relate to movements because CASCOM has no responsibilities for the development of these strategic systems. TC AIMS II is an attempt to create a seamless bond of information between the strategic and operational but is untenable because there is no corresponding developmental effort at the strategic level. These strategic STAMIS are the responsibility of USTRANSCOM subordinate commands. The information that is generated by the 14 STAMIS at the strategic level will continue to strain the efforts of the operational logistics because the information is being initiated by various sources under different formats and in varying degrees of detail.

The Global Combat Support System Army incorporates the functions currently covered by SARSS, SAAS, Unit Level Logistics System (ULLS), and the Supply Property Book System (SPBS). In essence, the GCSS-Army will incorporate into one STAMIS the functions maintenance, supply, arm, and other logistics management functions at the operational and tactical level. As a complementary effort to

GCCS-Army, the Army Materiel Command plans to develop a STAMIS to consolidate functions performed by various STAMIS at the wholesale level.[50]

In the transportation arena, TC AIMS II will consolidate onto one STAMIS the JOPES interface functions and the movement control functions for use at the operational and tactical levels. USTRANSCOM needs to take a corresponding effort to consolidate the strategic level transportation STAMIS. These 14 transportation STAMIS are vertical and non synchronous.

In short, in the supply arena there is an effort to consolidate strategic and operational level STAMIS and databases. In the transportation arena, there is an effort to consolidate operational level transportation functions but there is no effort to consolidate strategic level transportation STAMIS. Until this occurs there will continue to be inefficiency in the orderly transfer of quality and timely information between the supply and transportation databases which will affect the orderly and seamless transition from the strategic to the operational.

CONCEPT FOR DISTRIBUTION OF SUSTAINMENT

This section will describe the system for distribution for sustainment of critical supplies from the strategic through the tactical. The responsibilities of strategic level organizations for the provision and transportation will be provided and will serve as a backdrop for recommendations to improve the distribution and visibility of sustainment.

Central to the establishment of a seamless logistics system between the strategic and the operational; and strategic supply and transportation is the sharing of a common database and standardized protocols for the distribution of information. The databases currently supporting the logistics intelligence file and the strategic transportation STAMIS would be under one distribution database. This would eliminate the current practice of sending inputs to a regional database, which is then sent to another database such as LIF. The elimination of these redundancies, and standardization of inputs will help logisticians track cargo from end to end. For instance, cargo manifest submissions should be no later than one hour after takeoff for air terminal operations and for sea terminal operations the standard needs to be within 24 hours of vessels departure from the POE. Operational level logisticians will be able to query cargo status straight to the source.

At the unit level, operators will have access to real time data, which can be tracked through the unit level logistics system (ULLS). The current LIF is characterized by batch processing of distribution information, which makes the updates outdated and results in loss of confidence in the logistics system to provide intransit visibility of cargo.

STRATEGIC:

Communications capability is a pillar in the establishment of ITV from the strategic to operational. Any capability short of continuous communications jeopardizes seamless logistics for deployment, sustainment and redeployment. Communications capability will be imperative as we continue to support tailorable forces within hours and weeks. Lack of an immediately established communications capability will lead to confusion and preclude anticipatory logistics as the strategic pipeline connects at the operational level.

Shippers:

Provision of the critical supplies and booking of these critical supplies for strategic movement is the first step in the distribution process. This is the point in the logistics systems when the strategic supply handoff for strategic transportation to the operational and tactical. When a requisition is filled by the supply system (e.g. DLA and AMC) the requester is advised of the requisition fill. The shipper provides the proper codes in the requisitioning system to advise of the requisition fill and the projected required delivery date into their location. The tactical level user or logistics organization is interested in the real-time location and projected destination rather than when the shipment last reached a link and node. In addition, the visibility continues with a clear understanding of procedures and common databases that the tactical and operational levels can access to gain visibility and trace or divert shipments as necessary. A common database and set procedures are critical especially when several organizations are involved in the provision and distribution of critical supplies. Specifically, the shipper must have the means to input into a STAMIS to advise of this critical juncture when the cargo is offered for strategic transportation. This starts ITV at the strategic level and will continue with the orderly tracing of supplies from the strategic starting to the designated POE.

Depots must have the ability to advise USTRANSCOM through EDI that a shipment is in transit to a SPOE or APOE. This notification could also be a shipper's portion of a strategic transportation STAMIS. This level of fidelity will be useful for the operational commanders to acknowledge that critical supplies are enroute. Other examples of shippers are tactical and operational level units such as the Supply Support Activities (SSAs), Direct Support Units, Movement Control Battalions (MCBs), and Materiel Management Centers (MMCs).

Today, we see more contractors provide direct deliveries to the theater of operation, directly to a depot for configuration for onward movement or movement to an APOE or SPOE for direct delivery to the theater of operation. In 2010, we will continue to see an increase in the direct vendor deliveries. The types of supplies that vendors will deliver directly to units in the battlefield are Class I, II, III, IV, VI, VII, IX and other contract procured items. The concept of contractor deliveries at the tactical level poses a need to establish intransit visibility starting at the contractor's location and continued through the logistics system.

Contractors that conduct business with DOD must have Electronic Data Interchange (EDI) capability to transmit standardized shipment data along with the shipment and to databases specified by depots and USTRANSCOM.[51] The interchange of shipment data among EDI, AIT and the distribution STAMIS will be important to build documentation for strategic movements. DoD will need to establish standardized formats for contractors to transmit transportation data. Besides the requisite EDI capability, DOD should require contractors to provide and write data onto AIT tags in preparation for strategic movement. Contractors will have the responsibility for the control and maintenance of numerous of AIT tags and interrogators through the logistics pipeline. However, DOD enforcement of EDI and AIT capabilities at the contractor location will avert an additional movement to a depot.

At the onset of strategic movement of sustainment cargo, a likely scenario will be for contractors to send a commercial standard EDI with the container's detailed contents to a POE (Sea or Air). The contractors will forward information to the sponsoring depot to advise of requisition fill. Strategic movement can start at the contractor's location and not at a depot consolidated container point. For these shipments, the depot can establish ITV by making the necessary entries to the LIF and GTN. Because the POE has received advanced information via EDI, planning can occur to prepare better for the shipment overseas. The port commander (whether aerial or sea) can take the EDI entry to create manifests, input data onto AIT tags, and program containerization of cargo, if necessary. The goal is to have advanced shipment information via electronic means to organize shipments for strategic lift. A premise of this capability will be a disciplined approach with regard to the accuracy of the data received. While this technological justification may seem trivial, the benefits are exponential given the thousands of container and pallets transiting various POEs and Ports of Debarkation (POD) in support of an operation.

AIT (Shipper):

The integration of the AIT tags with STAMIS will enable the process of ITV. During the preparation for shipment at the shipper's location, data from the Automated Manifesting System (AMS) card will be transposed onto the AIT tags. These data will include the item(s) description, quantity, cube, weight, UIC and DoDAAC of the organization receiving the supplies. Data from the AIT tags can then be used by the shippers, POEs, and PODs to build manifests and to account for cargo. This will happen electronically and will be the input to integrate the AIT data onto the STAMIS.

Distribution Database (Shipper):

The shipper sends a status update to the distribution database for the tracking of cargo. This database will be used by the operational and strategic levels to maintain a common reference for intransit

visibility information. The input will show when the cargo has departed the depot and estimated arrival to the SPOE or APOE. Continuous daily updates by AIT through satellite will allow the users to know the exact location of the shipment.

The data can also be used to update the LIF so that the user will have an update of all sustainment cargo as it commences strategic movement. A user should able to input a unit identification number and be provided an immediate supply status update. Critical information will include location enroute, the RDD, POD and the vessel, and container or pallet identification of the cargo.

POEs:

The shippers' handoff to USTRANSCOM starts with the transfer of advanced data about the shipment. Precise information about the shipment such as the contents, addresses and Unit Identification Code, location of the unit of destination, cube, weight and materiel handling requirements will ease the strategic movement and alert operational and tactical planners of these movement considerations.

During the actual load up and departure of aircraft or ships, a status is annotated in a STAMIS to advise the operational commander that the shipment has departed. The information will have the vessel voyage number for ships and the tail number for airplanes with the RDD, POD, and the entire manifest. The data is sent to a common database for the strategic and operational user to access for ITV. An operational level user should be able to obtain the location of a part by merely using the document number or the Transportation Control Number in a search mechanism under a distribution STAMIS. Any of these two numbers will lead to a location, RDD, UIC, DODAAC, and quantity being shipped. In essence, with a common STAMIS and database, the intended user can instantly determine the precise location of critical supplies.

AIT at POE:

As the cargo arrives the POE, an RF interrogator will send updated location information via satellite to the central database. Users will again be provided an update through the LIF. For the operational logistics units responsible for logistics management, they will be able to track the cargo intransit and plan for reception and onward movement.

Distribution Database (POE):

The POE will load the vessel or airplane, build manifests, and send the data to the distribution database where the current location of the sustainment will be fused in the distribution database. For planning purposes at the operational level, theater movement control agencies and materiel management

centers can access the distribution database to start organizing the RSOI responsibilities. The Movement Control Battalions will need to organize the onward movement to the ultimate destination.

OPERATIONAL LEVEL:

PODs:

The cargo arrives at the POD. The POD will have advanced information about the vessel and airplanes to plan for the reception and the onward movement.

AIT at POD:

As the ship or plane arrives at the POD, data is transmitted from the AIT tags to the RF interrogator and is then sent to the distribution databases. This will again update the location of the sustainment for RSOI efforts.

Distribution Database (POD):

APODs and SPODs can access common database to plan better for the receipt of the cargo. At the critical stages of a deployment, the theater commander can better plan his receipt, staging, onward movement and integration efforts at the PODs and the Theater Assembly Areas. The Theater Support Command with its' Theater Army Materiel Management Agency and Theater Movement Control Agency will have the tools to carry out the simultaneous difficult tasks of RSOI, sustainment and establishment of lines of communication. The ability of Air Mobility Command, Military Traffic Management Command, Theater Army Movement Control Agency (TAMCAs) and the Theater Army Materiel Management Centers (TAMMCs) and to access these common databases with a common STAMIS will save precious time, and assist in organized RSOI efforts, and assist in the establishment of logistics operations in the theater of operations.

POD to Theater Areas:

At the operational level, the theater commander makes decisions about the priority of effort for a given operation. TAMCAs, TAMMCs, Movement Control Battalions use this information to program movement of critical supplies from the port to the user. The cargo destination can be to a theater support area, corps support area or throughput to a division support area.

Distribution Database (POD to Theater Areas):

Movement Control Battalions can access the distribution database, plan the RSOI of ships' and airplanes' arrival, and match the requirements with transportation capabilities. The flexibility of one distribution database is to access the data pertaining to strategic air and sea and being able to query immediately to the source if there is problem about the shipment. Through the query of data about one or several units' sustainment, the MCB can get a complete and accurate picture of where the sustainment is in the strategic pipeline. This happens with 1 database and not the 14 transportation databases. The movement control battalions can use the information to assess convoys routes, plan and conduct convoys, schedule intra-theater airlift, and rail operations.

AIT at Operational Areas:

As the cargo departs the port to its destination, a RF repeater will send data via satellite to update the distribution database. The cargo is destined to corps support areas, division support areas, supply support areas, and troop units.

TACTICAL:

In a theater with numerous APODs and SPODs and long lines of communications to Corps Support Areas and Division Support Areas, ITV will better assist the tactical commander with the limited number of transportation assets at his disposal. The Corps and Division Materiel Management Centers will be capable to manage better critical cargo in all of the logistics functions and assure that supplies are destined to the intended customer. Battlefield dynamics will challenge this task as units can change locations and command alignments through the employment of task forces. Corps Materiel Management Center will be able to access common databases to determine real-time ITV. The Movement Control Battalions at the Corps and higher will coordinate the common user transportation assets needed to meet the priorities. The logisticians' challenge will be to prioritize among the high priorities for onward movement.

AIT at Tactical Level:

RF Interrogator positioned in corps support areas, division support areas, and direct support units will allow for the intransit visibility of cargo to its final destination. The database is updated via satellite. Through the LIF, troop units will know that the supplies are already at the tactical support areas and arrangement is made for units to pick up supplies.

Distribution Database (Tactical):

The movement control battalions will send a location update for cargo through the distribution database. The materiel management centers are planning and coordinating the distribution effort at the tactical level. Other efforts include redistribution due to changing priorities. Intransit visibility of cargo ends when the sustainment is delivered to its final destination.

During redeployment of forces, the tactical level becomes the shippers. The principles and functions of ITV apply here as well. Deployment, establishment of support areas and redeployment can occur simultaneously. The flexibility of a distribution database will make it easier for theater logistics organizations to manage these movement and better use the limited transportation resources in the theater.

STRATEGIC RECOMMENDATIONS:

Recommendation A: DOD Development of Distribution Automated Information System

An alternative to an operational level STAMIS (TC AIMS II) with links to14 strategic movement STAMIS is to develop a STAMIS that incorporates all of the movement functions from the strategic to the tactical. The responsibility for the development of a DOD automated information system needs to be the U.S. Transportation Command. Goldwaters-Nichols Act of 1986 established USTRANSCOM to improve planning and execution of strategic movements.[52] USTRANSCOM has certainly improved strategic transportation. For a CINC to develop a STAMIS that goes beyond the strategic through the operational to the tactical will be a paradigm shift. However, to gain a seamless connection in transportation the information flow must also be seamless. The developmental effort would be a combined effort of the military services, Defense Logistics Agency, and USTRANSCOM.

The advantage of one DOD STAMIS that covers strategic through tactical level transportation is the simplification the cumbersome tasks of obtaining data from a myriad of databases. One DOD STAMIS that covers deployment of forces and the logistics pipeline will enable the CINC to synchronize the flow of forces and sustainment into the theater and will have the ability to make anticipatory changes dictated by operational requirements. The single movement STAMIS needs to incorporate the following main functions:

1. Shipper's module: This function is used by depots and other shippers to advise that a requisition is filled and strategic movement will start. Tactical level SSAs, MMCs and MCBs will have this capability.

2. Sea Terminal Operations: The functions currently performed by the WPS. These include the manifesting and the cargo accounting.

3. Air Terminals Operations: The functions currently performed by CAPS II. This includes cargo manifesting, and cargo accounting.

4. JOPES interface: The functions currently performed by the TC-ACCIS.

5. Movement Control: The functions currently performed by the DAMMS-R.

DoD would need to take a whole new look at the logistics processes and establish proponency for the distribution database which would fuse the data currently in LIF and the numerous transportation STAMIS. USTRANSCOM GTN has the potential to serve as this distribution database. The sea, aerial and shippers modules will have a common established standard for providing ITV information about cargo transiting critical links and nodes. Formats that are provided for ITV databases need to be embedded onto the STAMIS to allow little room for deviation and would create a common DoD understanding of information requirements for ITV.

Recommendation B: Outsourcing

Another option for consideration is to outsource the entire distribution of sustainment to reputable distribution companies such as United Parcel Service, Federal Express, or DHL. If implemented, DOD would be implementing their procedures and standards, and would be buying into their ITV capabilities. The advantages are instantaneous rather waiting for a lengthy developmental effort by DoD. DoD can implement this recommendation at the strategic, operational, and tactical level. In some cases, METT-T will determine if tactical level implementation is possible.

At the strategic level, depots and contractors would consign a shipment to a premium transporter. The company would be responsible to deliver the cargo to the operational level and be responsible for providing ITV at the strategic and operational level. The strict discipline proven by these companies would be an advantage to DOD users. These include detailed contents of cargo being transported. Simply put, if it is not properly documented it doesn't move. The other advantage is the fast delivery to a destination. The ability to deliver critical parts overseas within 24 hours is capability that we do not have today. These capabilities will alleviate the level of effort of the operational level organizations in trying to pull critical supplies from the strategic. Their level of effort can then be refocused at the operational and tactical levels.

A possible disadvantage will be the link between the operational and the tactical, if the distributor cannot deliver to the tactical level. Combat conditions may not allow a carrier such as Fed EX to deliver to some of the support areas. In such cases, DOD would use the ITV capabilities of these carriers and use

military transportation for delivery to the tactical level. Another consideration with outsourcing is the congestion and control of the airflow into APODs during a deployment. DoD would want to control the flow to meet better the commander's intent, which in most cases is closing of the force or critical packages within a force. Limitations in the number of APODs and the APODs capacity for reception will result in delays of premium air shipments. For instance, rather than delivering in 24 hours, the delay can cause the cargo to arrive within several days.

A combination of these options may be possible. In the event of forcible entry into a theater, the first recommendation may be the most feasible. The outsourcing option has proven effective during peacetime and can work in a combat zone where there is no situation where forcible entry is likely.

In the implementation of these systems, costs need to be weighed in terms of the project benefits to the warfighter. The need for the establishment of a reliable distribution system for cargo, the projected force structure cuts and the increasing reliance on strategic logistics will drive a need for focused information and fewer mistakes in the logistics system, which ultimately affects the readiness of the combat force. These initiatives are designed to create a seamless distribution system in light of the projected cuts in logistics force structure. The simultaneous efforts of deployment and sustainment make strategic transportation and even operational transportation assets extremely valued under most contingencies.

DISTRIBUTION DISCIPLINE

A new distribution system will be the key tool in the revolutionizing of logistics sustainment. An equally important imperative will be a revolution in the discipline of the distribution systems. The proposals made to develop a new distribution system can only be as effective with the complementary efforts of supervision over all aspects of provisioning and distribution.

In recognition of the need for discipline, the U.S. Army directed the Rand Arroyo Corporation to conduct a top-down review of the logistics processes. The review, named Velocity Management, was the total quality management initiative to improve these processes.[53] Under this concept, logisticians at all levels were held responsible for their sectors of the complex logistics pipeline. Actions included performance evaluations, identification of problem areas and streamlining of processes to improve the efficiency of the system. Velocity Management evolved from an evaluation of supply processes to a more holistic approach that embraced transportation performance indicators. These transportation indicators included the time awaiting onward transportation at the POEs and PODs.

An omission in the Velocity Management program is the lack of evaluation of poor or no transportation documentation. Proper documentation is a responsibility of all activities that provide and

transport sustainment. Proper documentation should be added immediately as a performance standard. We have seen this deficiency repetitively in contingency operations from Desert Storm to the present. The impact of proper documentation to Velocity Management has more of an influence to the provisioning of sustainment than the factors that are currently evaluated. Velocity Management happens with Velocity Transportation. More pressure needs to be placed on the shippers such as depots and contractors for proper documentation. DoD needs to adopt the same tough standards that commercial transportation companies enforce.

There is no overseer for Velocity Management at the joint level. This is an Army program; however, most of the organizations that influence supply and transportation performance are joint. DoD should implement Velocity Management program across DoD and should appoint USTRANSCOM and DLA as the overseers of Velocity Management with the JCS J4 having oversight for the JCS. An activity is needed to evaluate the performance of logistics at the strategic level. Under the current system, each logistics organization conducts self-evaluations and takes actions to improve logistics process within its area of responsibility.

While discipline is not a new concept, lack of it hinders the effectiveness of the system and any improvements to capability. The distribution process is joint and needs a DoD overseer.

DOD MOVEMENT PROCEDURES:

The Military Standard Transportation and Movement Procedures have not had a major revision in 30 years.[54] This area is linked to discipline because the enforcement of distribution must be measured against a standard, which are the DoD movement procedures. Currently, under the proponency of the Defense Logistics Agency, the MILSTAMP does not have new procedures for the innovations and challenges that the DOD faces today. DoD needs to explore modernizing its movement procedures. An option may be to outsource the myriad of documentation processes to private contractors such as United Parcel Service or Federal Express. Another option may be the development of new procedures. If the latter is adopted, the logical proponent for the DoD needs to be the U.S. TRANSCOM with the assistance of the Defense Logistics Agency. While DLA has a DoD logistics responsibility, the broader strategic movement challenges of unit deployments and sustainment belong to the U.S. TRANSCOM.

Some of the areas that need immediate DoD guidance:

-Use of AIT tags in the Defense Transportation System.

-ITV databases and formats.

-Contractor's responsibilities with respect to strategic movements, EDI requirements and information needed by depots and POEs for strategic movement.

DoD strategic logistics needs an overseer in transportation and supply areas to ensure quality distribution from the strategic to the tactical level. Logical candidates to assume this role are the USTRANSCOM and DLA with oversight from the JCS J4.

CONCLUSION

The lessons of Operation Desert Storm emphasized several key points about our national strategy. We are and will continue to be a power projection Army. Furthermore, in meeting the nation's demands, U.S. Armed Forces will be tailorable packages capable of strategic deployment within hours and days of notification. This imperative dictates the need for focused logistics and intransit visibility of all cargo throughout the logistics pipeline.

Operations lessons learned drove the logistics community to initiatives such as AIT and the myriad of related STAMIS that lacked integration. The lack of a central strategy for STAMIS led to numerous vertical development efforts resulting in little or no horizontal synchronization. Recent low intensity peacekeeping operations have highlighted the importance of integrated logistics management, the criticality of real-time logistics information and the most importantly a trained team of logisticians to bring about the requisite logistics capability from the strategic to the tactical.

In this decade, the Army has realized that focused information contributes to focused logistics. In the supply arena, the recent efforts to consolidate strategic and operational level STAMIS attest to this recognition. TC AIMS II is an effort to consolidate transportation STAMIS at the operational and tactical level. A corresponding effort is needed to consolidate the strategic transportation STAMIS. When this occurs, the seamless connection between the strategic and operational will happen.

A concomitant effort among the logistics community will be a renewed discipline that will include the more performance criteria in documentation accuracy. In addition, efforts to revise the current MILSTAMP procedures will enable the process of establishing detailed accountable sections within large logistics organizations. This will be a major step in improving distribution processes as a force multiplier in 2010.

Word count is 8905

ENDNOTES

[1] General Eric K. Shinseki, Address to the Eisenhower Luncheon, 45th Annual Meeting of the Association of the United States Army, 12 October 1999.

[2] United States Army Combined Arms Support Command (CASCOM), USACASCOM Pamphlet on Battlefield Distribution, 22 May 1999, 9.

[3] I was the G3, 3d Corps Support Command, V Corps, Wiesbaden, Germany during the deployment of Task Force Hawk into Albania and evidenced the level of effort taken by the theater logistics agencies to simultaneously deploy and sustain the Task Force. Most of the difficulties resulted from obtaining intransit visibility data for sustainment from the strategic to the operational.

[4] CASCOM, TC AIMS II White Paper: An Operational Guide about how the Army will use the Joint System, 30 July 1999, 7-10.

[5] Department of the Army, Corps Support Operations, FM 63-3, (Washington D.C., 30 September 1993), 1-1 through 1-16.

[6] Office of the Chairman of the Joint Chiefs of Staff (OCJCS), Joint Vision 2010, (Washington D.C., OCJCS), August 1996, 24.

[7] Office of the Chairman of the Joint Chiefs of Staff, National Military Strategy of the United States of America, 1997, 26-27.

[8] Ibid 26-27

[9] Joint Vision 2010, 24.

[10] Department of Defense, Department of Defense Strategic Logistics Plan, (Under Secretary of Defense Logistics, Washington D.C., Edition 1994), 5.

[11] Department of the Army, Army Vision 2010, (Washington D.C. OCSA), January 1997, 15-16.

[12] Department of the Army, The Army Strategic Logistics Plan, (Washington D.C., Department of the Army), 5.

[13] Department of the Army, Operations, FM 100-5, (Washington D.C. 1993), 12-3,12-4.

[14] General Eric K. Shinseki, Address to the Eisenhower Luncheon, 45th Annual Meeting of the Association of the United States Army, 12 October 1999.

[15] Scales, Robert, Major General, Certain Victory, (A select reprint from the U.S. Army Command and Staff Command and General Staff College Press, Fort Leavenworth, Kansas), 75-82.

[16] I was the Commander, 1318th Medium Port Command, Rotterdam, The Netherlands, August 1995-July 1997. I experienced the deployment and sustainment for Operations Joint Endeavor and Forge. Most containers destined for Bosnia had poor documentation, which resulted in the shipment being diverted to Central Region for staging and reconfiguration before onward movement to the Balkans. The

Military Traffic Management Command's use of liaison officers in U.S. European Command, U.S. Army Europe, and the 21st Support Command were instrumental in communication the theater's intent with respect to the destination of the containers.

[17] USACASCOM Pamphlet on Battle Distribution, 6-8.

[18] Barnes, Al, "RF Tag Briefing", available from <http:www.cascom.lee.army.mil/automation/tcaims/rf_data_tag_format/RF_format_source. Accessed 7 Dec 99.

[19] Worldwide Port System was first fielded at the Port of Rotterdam in Jun 1992. The systems were under experimentation for several years and were finally fielded to all MTMC ports. The completion of the fielding was finished during FY 97.

[20] As the Commander of the 1318th Medium Port Command, I observed this AIT test. The test evaluated the ability to access data through regional databases, use and employment of AIT tags and interrogators, and the use of satellite technology to consolidate logistics information.

[21] CASCOM White Paper TC AIMS II, 7-10.

[22] Corps Support Command, FM 63-3, 3-2.

[23] Boren, Patricia; Girardini, Kenneth; Wang, Mark; Performance Drivers for CONUS and OCONUS Order Ship Times, (Rand Arroyo Corporation, March 1999), 4-5.

[24] Ibid.

[25] Ibid.

[26] Ibid.

[27] Ibid.

[28] Ibid.

[29] Ibid.

[30] Ibid.

[31] Ibid.

[32] Ibid.

[33] Ibid.

[34] Ibid.

[35] CASCOM White Paper TC-AIMS II, 5-7.

[36] Ibid 7.

[37] Ibid.

[38] Ibid.

[39] Ibid.

[40] Ibid, 8.

[41] Ibid.

[42] Ibid.

[43] Ibid.

[44] Ibid, 9.

[45] Ibid.

[46] Ibid.

[47] Ibid.

[48] Ibid.

[49] Ibid.

[50] USACASCOM, Mission Needs Statement for Integrated Combat Service Support STAMIS (ICS3), (HTTP:/www.cascom.lee.army.mil/aut.ort_system-Army/mititary-needs.htm)> accessed on 1 December 1999, 7.

[51] Frohman, Harold L.; Ledder, William R., Doing Business with DoD Using Electronic Data Interchange, (Logistics Management Institute, April 1993), 5.

[52] Goldwater-Nichols Department of Defense Reorganization Act of 1986, Public Law 99-433, Sec 212, (1986).

[53] Peltz, Eric; Girardini, Ken; Lackey, Art; Totten, Mark; Using Velocity Management to Improve Logistics Quality: Serviceable Returns as a Quality Indicator, (Rand Arroyo Corporation, January 1999), iii.

[54] Department of Defense, DoD Military Standard and Movement Procedures, available from <http:/web7.whs.osd.mil/html/450032r1.htm>, internet, accessed 9 December 1999.

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