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Global Responsive Logistics

How does the logistician of tomorrow manage distribution and materiel to achieve priorities outlined in the Army 2020 and Beyond Sustainment White Paper "Globally Responsive Sustainment"?

Globally Responsive Sustainment requires sustainers to fulfill global logistics needs with a force that is regionally aligned. It demands that they be fiscally responsible while seeking best value, and anticipate future requirements. It requires distribution and materiel systems and managers across all levels, multi-national forces, and commercial industry to synchronize and 'keep up' with advancing technology in order to meet operational sustainment needs.

"Gentlemen, the officer who doesn't know his communications and supply as well as his tactics is totally useless" – Gen George S. Patton, USA

Not knowing when and where materiel and supplies are within the pipeline has decreased with automation, but still needs improving. Unfortunately this is something the Army has dealt with for years. In the July-August 1970 Army Logistician magazine, COL Theme T. Everton wrote an article entitled, "Inventory in Motion" as part of a four part series to then Lieutenant General Joseph M. Heiser, Jr, Deputy chief of Staff of Logistics', article: "The Logistics Offensive" The logistics offensive was an Army-wide program designed to reemphasize logistic principles, update and refine techniques, revise systems, and more clearly define training and career management objectives.[1] The logistics offensive supported General Westmorland's four M's—Mission, Motivation, Modernization, and Management.[2]General Westmoreland demanded efficiency in logistics operations to benefit all American's—both Soldiers and taxpayers.

Today, logisticians also face a "logistics offense" challenge; in fact many of the issues and concerns from the1970's are still with us today due to automating functions, rather than taking a holistic view towards automating the enterprise processes of distribution and materiel management.

Strategic Guidance

The Chief of Staff, General Raymond Odierno has called upon the Service to provide expeditionary, decisive land power to the Joint Force, and be ready to perform across the range of military operations to ***Prevent***, ***Shape***, and ***Win***.[3]To do this, the Army must be ***Globally Responsive***, and ***Regionally Engaged***.

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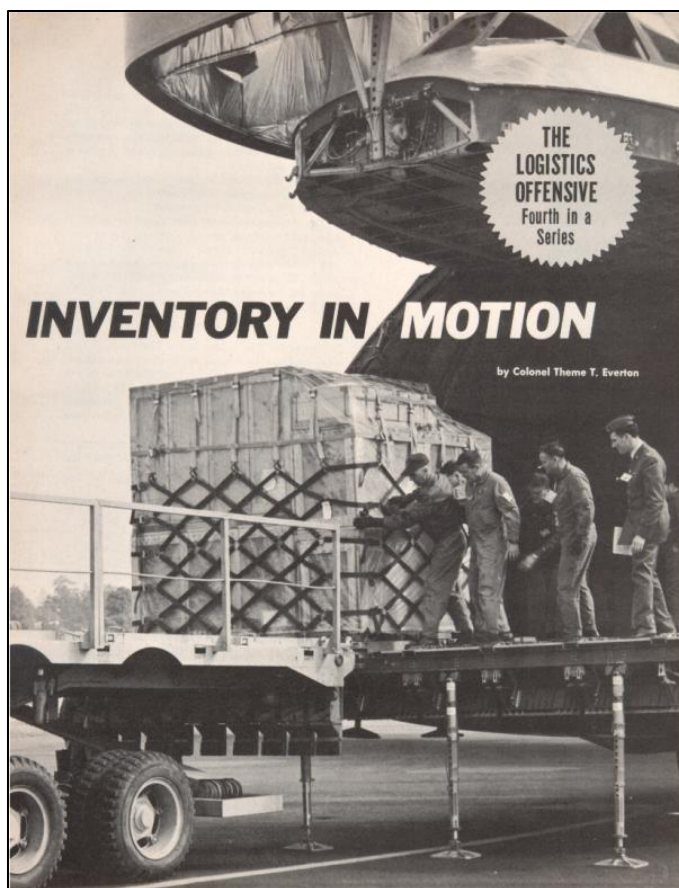
[1] Heiser, Joseph M. LTG, Army Logistician Jan-Feb 1970
[2] Ibid.
[3] 38th Chief of Staff, U.S. Army Strategic Vision

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It must also provide this service with a smaller force, under fiscal constraints, and after 12 years of combat in two major campaigns. The strategic guidance to meet his intent is found in the *Army 2020 and Beyond Sustainment White Paper: Globally Responsive Sustainment*. This article serves as a conversation to help sustainers understand the complexities of distribution and materiel management, which are the two most challenging realms of defense supply chain management.

Distribution and materiel managers must understand that the defense supply chain model is global; extremely fast paced, and that management levels overlap from strategic national providers down to the tactical sustainment unit. Strategic distribution decisions can quickly have tactical implications, and tactical distribution decisions can have strategic impacts. The following are discussion points to support Global Responsive Logistics.

1. **Materiel and distribution managers need to understand the defense supply chain model early on in one's career.**
2. **Distribution is a complex task. The defense distribution network is robust, and continues to develop as the Services require a need to move a "thing" to the "right place" at the "right time". Distribution is frustrating to understand, because there isn't a "one size fits all" solution to a distribution need.**
3. **Commodities are requested and moved differently. Each commodity grouping uses specific materiel ordering systems, and distribution booking and handling systems. These commodities may be categorized and booked for transportation as sustainment cargo, or deployment cargo—which are handled differently.**
4. **Materiel and distribution managers must integrate their staffs, and electronic sustainment information systems to truly achieve synchronization.**

Defense Supply Chain Model

Growing strategic logisticians is important, and should be done so at an earlier phase of a logistician's career. One must study the procurement, inventory, and warehousing procedures that Defense Logistics Agency (DLA) executes, and the physical distribution executed by United States Transportation Command (USTRANSCOM) to help understand the defense enterprise supply chain management model. The defense supply chain management model, taught at the Army Logistics University, has three main ideas behind supply chain management, which are: source, make/repair, and deliver.

The source, make/repair, and deliver management levels overlap each other. The Army's challenge is to ensure that the overlaps are seamless in respect to electronic sustainment information systems, people and organizations, and physical movements. Without having a basic understanding of how the joint defense supply system works, tomorrow's sustainer will lack strategic vision on developing a theater logistically. It is vital to understand all layers of sustainment from tactical to operational to strategic, so that a complete global responsive sustainment network can be developed.

Distribution is Complex

Distribution within the context of a military logistics operation is simple to define, but challenging to accomplish. ADP 4-0 defines distribution as the operational process of synchronizing all elements of the logistic system to deliver the "right things" to the "right place" at the "right time". Distribution is made up of a series of networks to accomplish the delivery. The physical, communication, financial, and information network make up the Joint Deployment and Distribution Enterprise (JDDE), or the Global Distribution Network; all are required to ensure that distribution management occurs.[4]

Distribution management is a subject of continuous refinement within the logistics community. As long as there is a demand for a "thing", there will be a requirement to perfect getting the thing to the right place at the right time. *The most important concept to understand is that successful distribution relies on the integration of the logistics functions of transportation and supply and is dependent on movement control and materiel management*.[5]

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[4] JP 4-09 pg II-1
[5] ATP 4-01 DRAFT, pg 1-1, para 1-1

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The reliance on *integrating* transportation and supply systems and *depending* on movement control and materiel management to achieve successful distribution proves the most challenging within the defense logistics system.

One should also be aware that there are two separate types of distribution: Deployment and Sustainment. Although they will be discussed later in this article, it is worthwhile to state up front they have distinctly different ways of being processed for distribution.

There are a myriad of transportation/distribution systems between the unit level and the strategic level to ensure that distribution occurs within the pipeline. Equally complex is the numerous materiel management/supply requisitioning systems. As requirements grow, so does the need to develop a system that achieves the maximum efficiency to procure and move those requirements. The electronic sustainment information system pipeline within the distribution pipe, as depicted in figure 1-1, is the pipeline often misunderstood amongst logisticians.

Figure 1-1
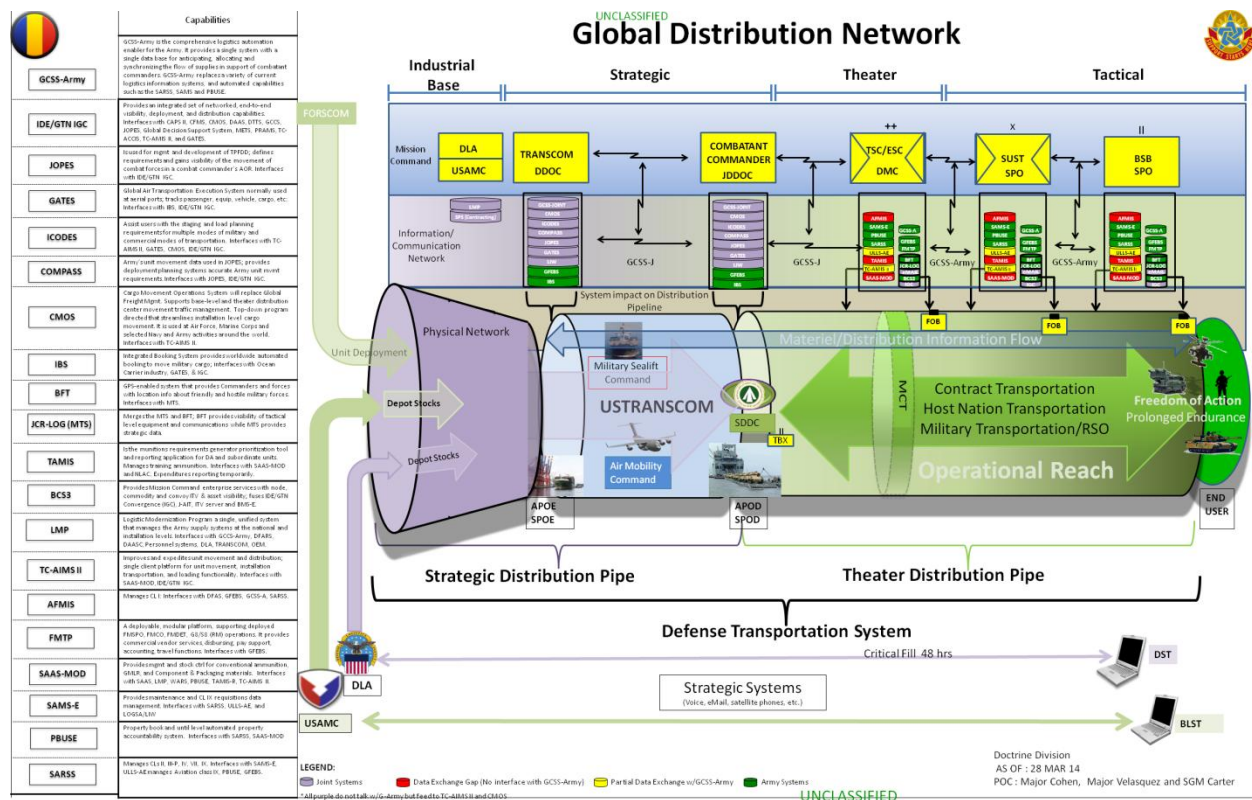
The distribution and materiel pipeline depicted in figure 1-1 shows the complexity of electronic systems, and physical distribution systems to bring units, equipment, and sustainment into a theater. From industry to foxhole, there are multiple SIS and distribution systems to communicate through, as well as agencies from tactical to strategic. All efforts are moving the 'thing' to the point of need; however, the complexity of the entire process is evident.

Today the integration of both transportation and materiel management systems leaves much to be desired with the existence of breaks/gaps/chokepoints that must be overcome for a more streamlined and responsive distribution and materiel management capability for the logistician. Technology changes at a rapid pace, and distribution timelines are shrinking as a result of technology. This is good, and it supports Globally Responsive Sustainment. But the distribution manager of today and tomorrow must be able to keep up with technology to ensure that sustainment information systems continue to meet the fundamentals required to achieve successful distribution and materiel management. For example, if a materiel management system improves efficiencies for warehousing and cataloging, but cannot effectively communicate to the distribution systems, then a *chokepoint* will occur. And vice versa, if a distribution management system becomes so efficient within the transportation realm, and materiel management systems cannot keep up with inbound and outbound shipments, then a *blind spot* will occur. ***Chokepoints cause***

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shortfalls in military operations, and blind spots cause commanders to make decisions without all of the facts. Both chokepoints and blind spots elevate operational risk.

Commodities are Requested and Moved Differently

 Army Sustainment Information Systems (SIS) do not by themselves provide full end to end connectivity/visibility of the requisitioning of or transportation flow of an item requested by a user in the field. In fact, today there is no single system that actually processes all classes of supply requests/requisitions from initiation to fulfillment. Most classes of supply have their own exclusive SIS that processes their requests that seldom interfaces with other SIS. For example, Class V processes one way, Class II, IV, IX another and Class III (B) yet another.

Figure 1-2
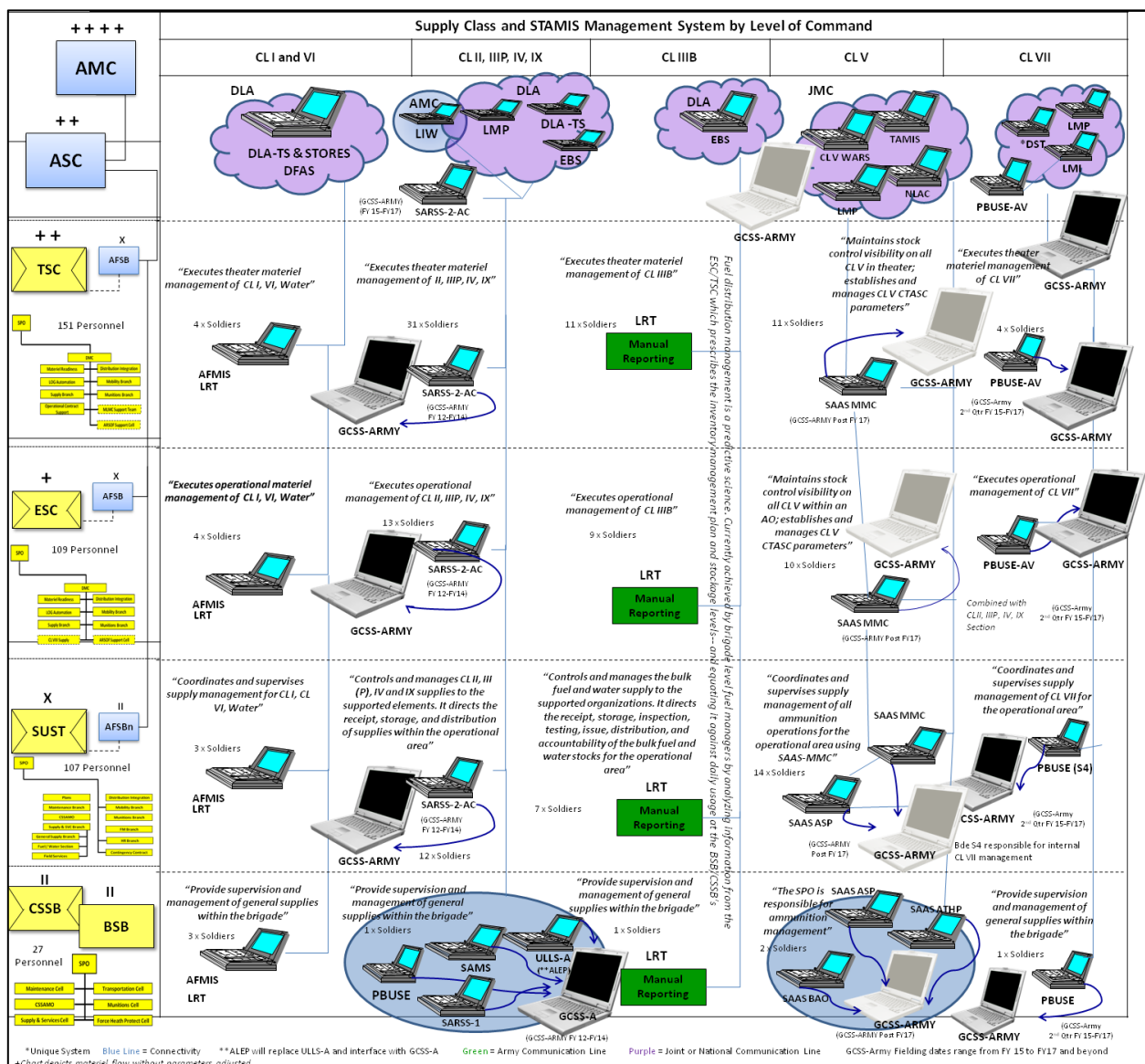
Each level of sustainment command and each commodity have a different materiel ordering system and standard operating procedure to requisition materiel. These all feed into strategic joint national level systems. In the future GCCS-Army will help streamline some, but not all of these commodities. For example, Class IIIB is still very much a manual reporting system.

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From retail to wholesale, a request not only passes from one SIS to another, but can also change from a green (Army) system to a Purple (Joint/DoD system) depending on fulfillment. Likewise, movement of materiel has similar system crossovers and independent packing/shipping requirements relative to the commodity itself. At each point of passing between systems there is the possibility of loss of information or delay in processing, and an associated loss of visibility.

Some sustainment information systems overcome this by having active interfaces with their handoff partners. Others rely on sneaker net, which is the process of transporting a CD or hard copy of the information to the next operator of an automated system. In some cases, the logistics community still spends time consuming manual reentry of information to keep the process flowing. These manual data transfer entry methods introduce human error probability, and multiply the likelihood of visibility loss or processing the wrong item and/or quantity due to keystroke entry.

Data transfer points, dependent on their location and complexity, become information blind spots, choke points, or gaps that impact the completion of the distribution flow from and to the end user. In a recent review conducted at CASCOM materiel request and distribution flow were dissected and scrutinized which resulted in identifying data blind spots, choke points, and gaps. Some interfaces that were thought to exist were either broken due to one system upgrade or revision without proper coordination with its trading partners, or that the interfaces were no more than paper agreements with no underlying funding or programming to make them an actuality.

That said, in spite of these data flow gaps, the distribution process manages to succeed in its mission. A success due to availability has been the proliferation of email and cell phone communication employed within an operation. These 'off line' communication networks have been used at every level of the theater, not only by the requester and his chain of supply, but by industrial base representative imbedded throughout the theater. The 'off line' network has succeeded, sometimes even providing materiel to the user in advance of the standard program of record process. But the 'off line' communication request has created another layer of complexity. Problems such as: lack of accountability, unannounced and unexpected delivery, unintended creation of excess and exceeding unit funds have created logistics problems which reach strategic levels of frustration.

Figure 1-3

Perhaps a better metaphor to explain this situation would be rather than referring to "lines" or "pipelines" in this supply-transportation relationship, one should instead consider the interrelationships of the various systems to that of a suspension bridge supporting cable. If you examine a major suspension bridge cable to view its construction you would find a number of smaller cables intertwined to increase the strength of the larger cable they become. In our case you have three such cables: *supply requisitioning*, *distribution*, and the aforementioned *off line communication networks*. The intertwining and binding of these three cables insure a single purpose is met, that of supporting the bridge from one end to the other, and to the uninitiated it appears to be a single cable performing that mission.

Furthermore, due to that intertwining, if any single cable is frayed or has a small break, the surrounding two other cables provide a connectivity to ensure the single purpose of the supporting cable is met and the bridge does not collapse due to the weakness of any individual cable. The frays or breaks in the cable equate to the information gaps/blind spots/chokepoints we discussed earlier in the transportation and distribution process. This metaphor is reinforced with the fact of each of the three individual cables also consist of smaller individual wires that are twisted and intertwined to create that single subordinate cable. The supply information cable is made up of the multiple sustainment information systems depicted in figure 1-2, the distribution cable is constructed form the various systems reflected in figure 1-1, and the communications cable has the previously mentioned capabilities of email, cell phone, and other independent battlefield systems and applications.

The construct we've described clearly reflects why we've been unable to achieve efficiencies that distribution giants like Wal-Mart, Amazon, or FedEx possess. Although the distribution and materiel management process' have a single overall purpose: getting the soldier that which he or she needs just in time, the ownership over the various systems of record and associated applications prevent a singleness of management that private logistics industry possesses. The structure and framework of commercial logistics companies are solely owned and focused on a single goal: make money. Outside agencies/activities become part of the company's process only based on their relative value added to the company's basic mission and their conformity to that particular company's structure. The DoD /Army conglomeration of systems that make up global distribution serve many competing priorities, a

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multitude of different goals, and do not share a single architectural structure and language. Use of middleware, system interfaces, policy directives, and such assures the logistician eventually obtains the information he or she requires but it falls short of the instantaneous and single point of entry that their commercial logistics company enjoys.

Deployment Distribution and Sustainment Distribution

Understanding distribution is challenging. Most entry points of learning distribution follow the deployment process taught to distribution logisticians through unit movement officer courses, the deployment suite of courses within the Joint Staff/Joint & Coalition Warfighting Joint Deployment Training Center, and at professional military schools such as the captain's career course, advanced leadership course, the sergeants' major academy, and command and general staff college. However, sustainment cargo does not follow the deployment distribution booking process, and is *not* as widely understood throughout the logistics community. Sustainment cargo is largely managed at strategic and operational levels of logistics such as DLA and USTRANSCOM; however, it often impacts the army at the tactical level. For example, sustainment cargo such as Class IIIB may be sourced, booked, and transported all by a national level provider, however, if it is not synchronized at the operational and tactical level for end delivery, problems may arise. ***There will always be a METT-TC consideration that all materiel and distribution managers should consider.***

Booking sustainment cargo takes place within a few centrally managed offices through a number of booking data sharing systems. USTRANSCOM, the distribution process owner, manages the day to day booking operations through Air Mobility Command and Surface Deployment and Distribution Command. Systems such as Cargo Movement Operations System (CMOS), the Direct Vendor Delivery Electronic Data Interchange (DVD EDI), Global Freight Management (GFM) and the Integrated Booking System (IBS) are used to connect the materiel release points to the shipping mode operator.
USTRANSCOM is the distribution process owner. This means that they are the strategic interface between strategic providers such as Defense Logistics Agency (DLA), Army Materiel Command (USAMC), Joint Munitions Command (JMC) and any other provider requiring transportation.

After the strategic booking means has taken place, the item is physically moved from the port of embarkation to the port of debarkation. At the port of debarkation, the materiel reaches the operational level of materiel and distribution management. This is an important stage of distribution and materiel management, as the "thing" has now reached a mission command level that is managed by forward deployed military forces. One of the biggest challenges at this juncture is gaining visibility and programming lift against ever changing priorities. The Army continually prioritizes shipments and commodities based on the commander's plan. Operational and tactical distribution is fluid, as the operational need changes based on how the operation develops. The defense system cannot simply use a first in first out system, or a tiered payment system for faster delivery such as commercial distribution giants like Wal-Mart, Amazon, and FedEx are able to do. At the operational and tactical level, distribution is driven by the commander's priority and need.

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An Ammunition Vignette

Figure 1-4: *Class V Materiel/Distribution Process* depicts the tactical, operational or theater, strategic, and industrial base levels of materiel and distribution management systems that are involved in a requisition fill from the forward deployed tactical level. Materiel managers use the Total Ammunition Management Information System (TAMIS) to forecast munitions requirements. The forecasted ammunition requirement is sent electronically to the National Level Ammunition Capability (NLAC), which is a national strategic enterprise system. NLAC is a critical interface electronic system which helps depots, the industrial base, and distribution managers see the requirement. The ammunition need is sourced and communicated to USTRANSCOM through the Munitions Transportation Management System (MTMS). This system allows the distribution managers to create transportation control movement documents to physically move the ammunition to the point of need. The chart assumes that the munitions need cannot be filled at an installation ammunition supply point (ASP), ammunition transfer holding point (ATHP), or theater ASP; and thus, it is forwarded to the national level. MTMS captures the requirement as a transportation need, simultaneously as the requirement flows up to national systems such as Worldwide Ammunition Reporting System-New Technology (WARS-NT), NLAC, and Logistics Modernization Program (LMP). When Joint Munitions Command, who ultimately manages DoD munitions, fills the requirement, USTRANSCOM moves the requirement. The ability to move the requirement from the materiel management system into the distribution system is achieved by integrating the electronic systems within the sustainment information systems. USTRANSCOM can then "see" the requirement, book the cargo, and physically move it.

Within the Class V Materiel/Distribution Process figure, there are communication gaps on both the human and electronic domain. The red arrows illustrate a system electronic gap, which requires people to interact *offline*. Distribution and materiel managers must be able to keep up with the fast pace information flow to fill those gaps with key organizations on both the materiel and distribution management level.

Shipping the commodity requires a level of trust between the customer and USTRANSCOM and their associated

Figure 1-4

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booking systems. Once the requirement/requisition has been booked into the distribution system, its physical movement takes place. The physical movement is synchronized between materiel management systems and distribution systems. These two management realms instruct warehouses and shippers what to do. Materiel release orders are generated instructing warehouses to pull and package, while military shipping labels are printed instructing where the item is to go. Distribution means by truck, air, rail, or vessel are booked for movement through Global Freight Management (GFM), Integrated Booking System (IBS), or the Global Air Transportation Execution System (GATES). Once a distribution mode has been booked, or programmed for lift, the item is picked up and shipped to its next destination. The process above is within sustainment distribution which we discussed earlier. When the item is moved under deployment distribution, it is similar, but is booked through the Joint Planning and Execution System (JOPES) process, and travels under a Unit Line Number (ULN). In the deployment realm, the customer or unit has a larger role in the distribution process as they will actually build the requirement in the Transportation Coordinator's Automated Information for Movement System II (TC-AIMS II).

Integrate staffs, and Synchronize Sustainment Information Systems

As we had mentioned earlier, many of the chokepoints/blind spots/gaps in the information flow depicted in the charts are relative to having to pass information to another system and finding out either the interface was broken, didn't exist, sneaker net, or complete manual rekeying. Both USTRANSCOM and the Army have undertaken actions to overcome these problems through the elimination/integration/subsuming of individual systems and functionality into single source/database/screen entities. This provides the user a single source to turn to for information and data entry which were previously dependent on multiple databases.

USTRANSCOM has already taken the Integrated Development Environment and Global Transportation Network (IDE and GTN) and combined them into IDE/GTN Convergence (IGC) and shifted the Worldwide Port System (WPS) functionality into the Global Air Transportation Execution System (GATES) creating a Gates-Surface (replacement for WPS) and a Gates-Air capability. Soon USTRANSCOM will be completing an integration of Joint Total Asset Visibility (JTAV) functionality into IGC as well.

The Army, on the other hand, has initiated the fielding of the Global Combat Support Systems-Army (GCSS-Army), an Enterprise Resource Planning (ERP) system which over time will replace the supply, maintenance, and property book systems in tactical units by 2017. This initiative will subsume the Standard Army Retail Supply System (SARSS) system completely by the end of FY 14 and by the end of FY17 subsume the Property Book Unit Supply Enhanced (PBUSE), and Standard Army Maintenance System-Enhanced (SAMS-E) systems. This will place all those functionalities into a single database and provide the user a single entry point. GCSS-Army also integrates financial accountability within its system via integration with the General Fund Enterprise Business Systems (GFEBS) ensuring that the Army meets the congressional directive for audit ability by 2017. After 2017 there are a multitude of other systems/functionalities that are within the parameters of the approved requirements document for GCSS-Army that would be subsumed dependent on funding. Those capabilities and the systems they *could possibly* subsume are, transportation/distribution (the functionality TC AIMS II), Ammunition (the functionality of Standard Army Ammunition System-Modernization [SAAS-MOD]), Army Prepositioned Stock operations at the installation /tactical level (replacing the Army War Reserve Deployment System [AWRDS]), Aviation maintenance for both manned and unmanned airframes (the functionality of Unit Level Logistics System- Aviation Enhanced [ULLS-AE] and/or the Aviation Logistics Platform-Enhanced [ALP-E]). Other possibilities include functionalities that have not been automated at this time such as bulk and retail fuel management; shower, laundry, clothing and repair; Petroleum Quality Analysis and Quality Surveillance to name but a few.
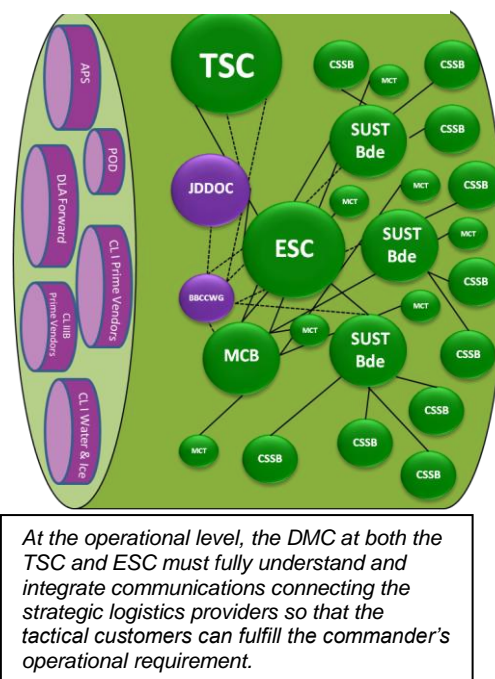
The transition in the tactical arena from traditional stovepipe systems to an integrated ERP single database system by its nature will overcome many of the existing blind spots/choke points/gaps, providing the Soldier a single screen for a majority of his logistical operations and minimizing his keystroke entries as he moves from one functionality to another. USTRANSCOM is progressing down the same path with its integrations and reduction of Joint systems that are integral to the distribution process affecting all branches of the service. Together they hold the promise of overcoming challenges that have been affecting the logistician for decades. It is an action that has taken considerable time and effort to progress as far as it has and which will take more cooperation, time, and money before a final objective for an integrated, near-seamless global distribution process is achieved.

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A challenge for operational level distribution and materiel managers is one of information and knowledge management. At the combatant command joint distribution and deployment center (JDDOC), and the theater sustainment command (TSC) and expeditionary sustainment command (ESC) distribution management centers (DMC), the personnel manning these centers must be knowledgeable on all sustainment information systems, their customers they support, the geographical environment, and the ever evolving situation. Communication, maximizing modes, and maintaining a common operating picture becomes vital to theater operational sustainment, and these three organizations are critical to success.

The operational level is where most uniformed logistics personnel will have direct impacts to distribution and materiel management. It is the connecting link between strategic and tactical distribution and materiel management. Understanding the flow of sustainment and mobility cargo from origin to the theater is important to make this link seamless. It requires understanding critical electronic distribution systems such as

GATES, IBS, Single Mobility System (SMS), and the IDE/GTN Convergence (IGC). DMCs should understand how forward enablers such as DLA Theater Consolidation and Shipping Points (TCSP), Class I prime vendors, Class IIIB prime vendors, prepositioned stocks, and the commercial port services available to the theater influence and support their area of responsibility. Tools such as Battle Command Support and Sustainment System-Node Manager (BCS3-NM) help the operational and strategic level provide the common operating picture for all sustainers to monitor.

Figure 1-5

At the operational level, the DMC at both the TSC and ESC must fully understand and integrate communications connecting the strategic logistics providers so that the tactical customers can fulfill the commander's operational requirement.

Conclusion

Distribution and materiel management are tough subjects to master. It is evident that there is no one size fits all solution as we have seen depicted in the commodity sustainment information system figures, and ammunition distribution vignette. For this reason alone, the Army must grow strategic logisticians who understand the defense supply model and how the complexities fit within the model. An enterprise solution will help master the complexity, but this task in itself will be difficult, lengthy, and costly to do. Approaching an electronic enterprise solution will include all services and require approval and backing from the DoD, not just the Army.

Achieving globally responsive logistics will require tomorrow's logisticians to understand the entire end to end process, what resources each global region has to bear, and the fundamentals of distribution and materiel management. As we move forward, strategic logistics will effect tactical decisions, and tactical decisions will have strategic impacts—in an ever shrinking globe, the logistician must be conscience of how their decisions within those levels affect the mission. Lastly, the globally responsive logistician must understand each distribution and materiel management system, and how commodities move through their respective pipeline in order to integrate logistics functions of transportation and supply across all domains, systems, and staffs.