



**ANALYSIS OF FRUSTRATED VENDOR HAZARDOUS MATERIAL
SHIPMENTS WITHIN THE DEFENSE AIRLIFT SYSTEM**

GRADUATE RESEARCH PROJECT

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AFIT/MLM/ENS/04-04

**DEPARTMENT OF THE AIR FORCE
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Wright-Patterson Air Force Base, Ohio

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AFIT/MLM/ENS/04-04

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Abstract

Since military units do not want to deploy with excess materiel or maintain large stockpiles of supplies, the services are looking to improve the purchasing and delivery processes of vendor items to overseas personnel. Unfortunately, due to miscommunication and overlooked transportation requirements some shipments are becoming frustrated and are delayed in reaching their purchaser or intended overseas customer when they enter the defense transportation system. The Under Secretary Of Defense for Acquisition, Technology, and Logistics has highlighted the problem of Government Purchase Card (GPC) purchases becoming frustrated upon entering the DoD organic distribution system and has addressed the documentation and modal packaging requirements of hazardous material.

This research quantifies the extent that hazardous vendor cargo is becoming frustrated within the defense airlift system and the potential improvements that can be made in guidance that is provided to GPC holders who need to purchase items from commercial vendors. A case study methodology is used to determine the top causes of cargo frustration, the average time shipments were frustrated, and what potential improvements could be made to reduce these discrepancies. Data includes interviews with aerial port personnel from Dover AFB and deployed GPC holders, literature review of existing GPC and hazardous material guidance, and archival data of frustrated hazardous vendor cargo. The research highlights areas for change including more involvement by transportation experts and improved communication of requirements.

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Vikki L. Ellison

This Note is not to be included with the Acknowledgments – it is for information only: *It is prohibited to include any personal information in the following categories about U.S. citizens, DOD Employees and military personnel: social security account numbers; home addresses; dates of birth; telephone numbers other than duty officers which are appropriately made available to the general public; names, locations and any other identifying information about family members of DOD employees and military personnel.*

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Analysis of Frustrated Vendor Hazardous Material Shipments within the Defense Airlift System

I. Introduction

Background

Lean management and shorter supply chains are goals and objectives for many firms and systems in all sorts of environments and economies. In the military these goals are often incorporated directly or indirectly into metrics goals and measurement standards. They are found in aircraft ground and take-off time metrics and in the response and employment times of many military units. The military expects to move its people and equipment as fast and efficient as possible. The ability to get the right stuff in the right place and at the right time in many cases has become easier in today's global environment with its high number of technological advances. Focused logistics and Future Logistics Enterprise (FLE) are key to achieving this ability.

Joint Vision 2010, and now 2020, espouse the concept of "focused logistics" as providing a key capability for the military. Joint Vision 2020 defines focused logistics as:

...the ability to provide the joint force the right personnel, equipment, and supplies in the right place, at the right time, and in the right quantity, across the full range of military operations. This will be made possible through a real-time, web-based information system providing total asset visibility as part of a common relevant operational picture, effectively linking the operator and logistician across Services and support agencies. Through transformational innovations to organizations and processes, focused logistics will provide the joint warfighter with support for all functions (JV 2020).

Future Logistics Enterprise is a set of synergistic and integrated initiatives, managed by the DoD and sponsored by the Joint Logistics Board (JLB), which is headed by the Deputy Under Secretary of Defense for Logistics and Material Readiness.

Logistics is recognized as a foundation and key enabler of the warfighter's ability to project force. It is critical for the DOD logistics community to drive programs of on-going improvements. Today (FLE, 2002):

- \$88 billion is spent each year in total on DOD logistics
- \$64 billion is spent each year on sustaining weapons alone
- \$58 billion is spent on research and development
- \$72 billion is spent on weapons procurement
- On average, it takes 18 days to fulfill an order
- The DOD has 600 legacy logistics systems with 400 million lines of un-integrated legacy code
- There is over \$50 billion in logistics inventory

In the *Future Logistics Enterprise (FLE) Roadmap to Transformation*, November 2002, the Office of the Assistant Deputy Under Secretary of Defense/Logistics Systems Management and ChainLink Research set the stage to communicate the FLE vision and objectives. The warfighter's requirement, as outlined by the 2001 Quadrennial Defense Review, is to have a ready and capable force—employ in 96 hours and deploy in 7-14 days—versus the 3-6 month timeframe of the past. The 21st century deployment sequence and footprint looks significantly different from the past. Air and ground troops lead, in parallel with infrastructure, versus the past model of creating the fixed infrastructure base and then projecting warfighters. This evolution is being driven by the changing political and economic landscape, with significant parallels in the private sector (FLE Roadmap, 2002).

Every military service component has been charged to provide consistent and reliable logistics support to meet warfighter requirements. One of the FLE goals is to facilitate the flow of materiel to the warfighter outside the continental United States. The services are looking more and more to improve the entire supply chain, looking at materials moving from the factory all the way to the foxhole. Military units don't want to deploy with excess materiel or maintain large stockpiles of supplies, if possible. But these units still want their supplies when they need them. The result and potential conflict of fast and easy internet purchases with the need for quality military materiel has yielded an increase of problems due to miscommunication or overlooked transportation requirements when these purchases enter the DTS. To take advantage of this new way of doing business, current policy and requirements may need to be changed.

In order to achieve the FLE goal there has been increased attention on "frustrated" shipments within the DoD transportation system. The DoD defines frustrated cargo as any shipment of supplies and/or equipment which, while en route to destination, is stopped prior to receipt and for which further disposition instructions must be obtained. A memorandum from the Under Secretary of Defense for Acquisition Technology and Logistics, dated 23 July 2003, sites problems with vendor contracts and Government Purchase Card purchases becoming frustrated within the organic distribution system (USDATL, 2003). The memo states that "frustrated materiel from vendors and GPC purchases has hindered consolidation and containerization point and aerial port operations in all recent contingency operations." The memo also published a set of "business rules" to assist purchasers in reducing frustrated shipments. Hazardous

material (hazmat) is a critical portion of these frustrated shipments. The rest of this chapter addresses GPC purchases, and hazardous material transportation requirements. It is the combination of these two areas and the lack of available data about these types of frustrated shipments that have yielded the basis of this research.

GPC/Contract Purchases

The Government Purchase Card (GPC) Program (previously known as, and referred to as, the International Merchant Purchase Authorization Card or I.M.P.A.C.) has allowed many military units the ability to procure supplies (directly from vendors) without the need to maintain excess inventory. The GPC is a bank backed credit card and works exactly the same way; it is an internationally accepted VISA credit card. It was adopted to replace the paper-based, more time consuming purchase order process, and it reduces lead-time requirements, transaction costs, and associated procurement office workload. Executive Order 12352 and then 12931, on Federal Procurement Reform, set requirements to expand the use of the GPC and to delegate the purchase authority to the lowest level possible; to the offices that will be using the purchased material. The order also emphasizes the use of commercial items while promoting value over low cost for supplies.

This program, while not without its faults, has brought many advantages to the military warfighter, especially those stationed or deployed overseas. Most military units have designated Government Purchase Card (GPC) Holders. According to the Department of Defense (DoD) Purchase Card Program Management Office's website, their FY 2004 metrics show there are 114,661 card holders who have spent

\$3,054,283,377 in 4,543,618 transactions (PMO, 2004). That is an average of \$672 per transaction (PMO, 2004). These card holders are trained and authorized to procure materiel through the use of the GPC. Purchasing required materiel either through a GPC or contract purchase has allowed military units increased flexibility by reducing carried inventory and access to greater variety, thus more capable, choices. It has become easier for military units both in the United States and overseas to access the internet and purchase any number of items needed to accomplish their mission. When military units deploy overseas, communication is often one of the first capabilities established, gaining access to the internet and GPC purchase option for required material and supplies not readily available.

There are two methods of delivery that GPC purchases normally follow: commercial door-to-door (the vendor is paid and assumes all transportation requirements), and those that enter the Department of Defense transportation system (DTS). In most cases, commercial door-to-door is preferred since ordering supplies or materiel over the internet usually provides a distinct “visibility” benefit when shipped solely by the vendor. When commercial transportation is not available or during military operations that prevent commercial transportation, the purchased material will enter the DTS. These shipments enter the DTS through military aerial ports, ocean ports, or container consolidation points (CCP). The vendor, in many cases will deliver the shipment directly to the DTS entry point. These shipments require appropriate packaging, documentation, marking and funding to enter the DTS. If any of these

requirements are lacking the shipment is considered “frustrated” until the discrepancies are corrected (AFI 24-201: 43).

Hazardous Materials

A particular restrictive category of cargo is hazardous material (hazmat). The Defense Logistics Agency uses the Department of Transportation’s (DOT) definition of hazardous material as: a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (CFR 49, 2003: 105.15). A common and more inclusive definition was found on numerous websites: hazardous material is generally defined as a substance or combination of substances which because of its quantity, concentration, or physical or chemical characteristics, may cause or significantly pose a substantial hazard to human health or the environment when improperly packaged, stored, transported, or otherwise managed (University of California, National Park Service, and BNSF Railway).

Regulations covering the packaging, identification, handling, and security of hazmat are referred to as Hazardous Materials Regulations (HMR). Much of our national hazmat regulations are modeled after the United Nations Model Regulations of Recommendations for the Transport of Dangerous Goods (UNECE, 2003).

The HMRs are found in the 49 Code of Federal Regulations parts 171 through 180 (myregs, 2004). The HMRs are designed to ensure that hazmat are packaged and handled safely during transportation, thus minimizing the possibility of their release should an

incident occur and to effectively communicate to carriers, transportation workers, and emergency responders the hazards of the materials being transported. Hazardous materials are essential to military units and the economy. Hazmat comes in many forms, such as batteries for a variety of uses, fuel for vehicles and equipment; they are used in medical units and many other places and processes. From the definition above, certain materials will be considered hazardous because of their great risk due to increased quantities; it is not uncommon for a material to be overlooked because of its prevalence or that in small quantities they are not considered hazardous. Hazardous materials are classified into nine general classes according to their physical, chemical, and nuclear properties, and military services must adhere to a variety of instructions in preparing, documenting and certifying hazardous material in different classes for shipment. The guidance is derived from the HMR and United Nations Model Regulations for Dangerous Goods. These apply across the military services and to vendor shipments that enter the DTS. Restrictions and guidance may differ depending on the mode of transportation required. In all cases, the shipment of material must meet the requirements of all modes of transportation utilized and the host nation requirements of countries that it will transit.

Problem

The Under Secretary of Defense Office has highlighted the problem of GPC purchases becoming frustrated upon entering the DoD organic distribution system and has published a set of Business Rules. These Business Rules explicitly address proper documentation and modal packaging of hazardous material (USDATL, 2003). This

research investigates the extent to which GPC purchased hazmat cargo is becoming frustrated and outlines specific deficiencies causing the frustration to occur.

Research Question

What is the extent that GPC purchases of hazardous material shipments are becoming frustrated upon entering the organic airlift transportation system and does the established guidance sufficiently address these types of purchases?

Investigative Questions

1. What is causing the GPC purchased hazmat cargo to become frustrated at an aerial port?
2. How many shipments were frustrated and how long were these shipments delayed at the aerial ports?
3. Does the GPC cardholder training adequately cover the purchase and transportation restrictions of hazmat?
4. What improvements in written guidance or training can be implement to reduce or eliminate frustrated vendor shipments?
5. What additional measures can be (need to be) implemented to improve the communication and understanding of transportation requirements between GPC cardholders and vendors to facilitate moving a hazmat purchase to the end customer?

Methodology

The research takes a qualitative approach to answering the investigative questions set forth in the study. Question 1 is answered through literature review and interviews with aerial port and GPC cardholder personnel. Question 2 is answered through a case study and archival analysis approach. The researcher visited and discussed this aspect of frustrated cargo with aerial port customer service personnel at Dover AFB, Delaware, analyzed and summarized data being collected by various DoD personnel through current studies and programs being conducted. This step reveals the depth of the problem.

Question 3 is answered where the researcher is able to determine who purchased the frustrated cargo. According to Air Force interservice guidance (AFM 24-204), frustrated cargo must have its discrepancy corrected before it will continue in the DoD transportation system. The cargo should be returned to the originator and at the originators expense for correction. Questions 4 and 5 are answered through interviews and analysis of data. Once collected and viewed in an aggregate form significant problems and solutions are presented and connected to one another.

Implications

The ability to measure frustrated cargo related to DVD (direct vendor deliveries), to include those procured via GPC, was sited as difficult by the Integrated Project Team (IPT) looking at the DVD process (DPO, 2004). This is one of three related programs that the Under Secretary of Defense Office is concerned with; Active Performance Management and an acquisition policy regarding contracts are the other two, which may yield additional data for this research project. The IPT lead, from the Defense Logistics

Agency, has shown keen interest in the results from this research and similar studies under way. The findings and potential benefits of this study may be used to speed delivery of materiel to the warfighter deployed to remote or limited access locations and helps the Air Force achieve the goals of FLE and JV 2020.

Assumptions/Limitations

Funding issues or distinction between individual, or micro-purchases, and contract GPC purchases are not explored in this research. Additionally, the focus of this research is on shipments entering the organic airlift mode of transportation and further limited to Dover AFB. Dover AFB is the main East Coast hub for most cargo leaving the continental United States destined for overseas units and possesses a large and representative amount of information concerning the researchers topic.

For the purpose of this research paper, individual and contract type purchases can both be made with the government purchase card. In many cases it may not be within the aerial port or researcher's ability to determine how the purchase was made, but it usually can be determined that the shipment came directly from the vendor. It is assumed that all vendor shipments were made using a GPC. Lessons learned and results from this research are applicable whether this assumption holds true or not.

The actual type of hazmat shipment and the necessity of the item is not studied. They are assumed to be valid requirements. The type of packaging in relation to the type of hazmat and necessary mode of transportation is addressed if it is determined that packaging was the cause of the shipment becoming frustrated.

Summary

Today's military units need to deploy without much advance notice and be equipped with the appropriate tools to accomplish their mission. Using the GPC offers the opportunity for quick purchase of the needed materiel. There will always be occasions when these purchases will need to enter the DTS. However, failing to meet the appropriate transportation requirements keep the materiel from reaching its intended recipient and may cost the purchasing unit time and money to correct the discrepancy and keep the item moving to its destination. Identifying the most common discrepancies and educating GPC holders on hazardous material transportation requirements can increase the flow of purchased products to the intended recipients and reduce the number of shipments that become frustrated.

II. Literature Review

Chapter Overview

To gain a better understanding of the Government Purchase Card policies and guidance, in particular its use in deployed situations, a review of DoD and service literature was conducted. This review included established and draft policy, training requirements, and other information. Through this review and focus on key connections, or lack of, to hazardous material purchases, an understanding of the process was gained. From there, applicable hazmat guidance was studied. It was assumed that GPC cardholders may not have much experience with hazmat and may have never been involved in the purchase of a vendor item that contains hazardous substance. GPC policies and guidance should provide adequate assistance ensuring the most inexperienced GPC user is successful in their transaction and delivery of goods.

Also, data from studies currently underway was reviewed. These studies offered insight into the current trends, pending guidance, and perceived problems surrounding frustrated hazmat vendor cargo. These studies also yielded data to quantify the extent to which this problem is occurring. Of particular note, was one study's concern and multiple other mentions in reviewed literature about lack of field data. This research adds to the body of knowledge currently emerging concerned with vendor shipments within the DTS.

Discussions with team leaders and functional experts provided additional value to the researchers search for a complete understanding of current trends and problems

identified with GPC purchased cargo (including hazmat) being frustrated within the organic airlift system.

Definitions

The following definitions and acronyms are commonly accepted and used as follows (USTRANSCOM, 2004):

Airlift Clearance Agency (ACA) – Military Service representatives that approve and validate the movement of DOD shipments via organic airlift.

Cardholder -- the government agent authorized to use the GPC for purchase activity. The cardholder and the customer roles may be the same individual or organization. For purposes of these “distribution processes, the activities below show only the “customer” as a role but includes cardholder activities within that role – the larger process map will need to expand these roles.

Commercial carrier – a private common user shipping company. For purposes of this process architecture, the term commercial carrier applies to organizations providing carriage that is not managed by the Defense Transportation System (see “lift provider”).

Customer -- the GPC ordering agent or intended recipient of the merchandise. For purpose of the distribution process, Customer and Cardholder and treated as a single role.

DOD Distribution Nodes – a functional activity in the DOD organic distribution system. These include:

Container Consolidation Point (CCP) – A DLA (Defense Logistics Agency) processing location at which government shipments can be originated, transshipped, or integrated into larger composite shipment units (air pallets, sea containers, etc). For the GPC pilot, the CCP may be the first point of entry into the DDS.

Aerial Port of Embarkation (APOE) – the point of departure for shipments entering the airlift component of Defense Transportation System, and generally the last transit point for shipments departing the CONUS or an OCONUS location.

Aerial Port of Debarkation (APOD) – the point of arrival in a theater or on arrival in the CONUS and generally the last node in the air segment of the DTS.

Lift Provider – the is a general role term for any organization provide carriage that is managed by the Defense Transportation System.

Merchant -- the commercial product seller. This is not necessarily a government contracted seller. For purposes of the pilot, the term merchant and vendor are synonymous.

Defense Transportation System (DTS) -- The organizations, personnel, equipment and infrastructure that are owned, operated or managed by the DOD in support of the transportation activities within the DOD Supply Chain.

DOD Distribution System (DDS) -- The organizations, personnel, equipment and infrastructure that are owned and operated by the DOD in support distribution activities within the DOD Supply Chain activities. DDS is synonymous with the phrase DOD Organic Distribution System.

Order Management System -- An organization, system, or activity that centrally controls and coordinates government purchase card distribution activities.

Routing and Clearance -- The group of processes that approve and authorize the use of the DTS.

Additional definitions that will add to the understanding of shipping requirements, agencies involved, and language used (DLA DDC, 2004):

DODAAC -- Department of Defense Activity Address Code

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA) -- group of airline members who adopted the rules set forth by the International Civil Aviation Organization (ICAO) and included additional requirements which are more restrictive, reflecting industry standard practices or operational considerations.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) -- group which sets the standards for international transport of dangerous goods by air.

MATERIAL SAFETY DATA SHEETS (MSDS) -- informational sheets provided by the manufacturer to buyers of chemicals produced; information includes chemical ingredients, physical data, fire and explosion hazard data, health hazard data, spill procedures, product trade name, manufacturer's address, and emergency telephone number.

RSPA -- Research & Special Programs Administration, US Department of Transportation.

TCMD -- Transportation Control Movement Document.

UN -- United Nations

Department of Defense

There is a gaining sense of urgency on the transformation of our military to adopt best practices, embrace technology and to meet the ever changing threats to U.S. security. The Future Logistics Enterprise is the DoD's plan to transform the logistics operation of the military into the most advanced synergistic collaborative supply chain in the world (FLE, 2002). This evolution is being driven by the changing political and economic landscape, with significant parallels in the private sector, as illustrated in Figure 1.

DoD Logistics Transformation Imperative

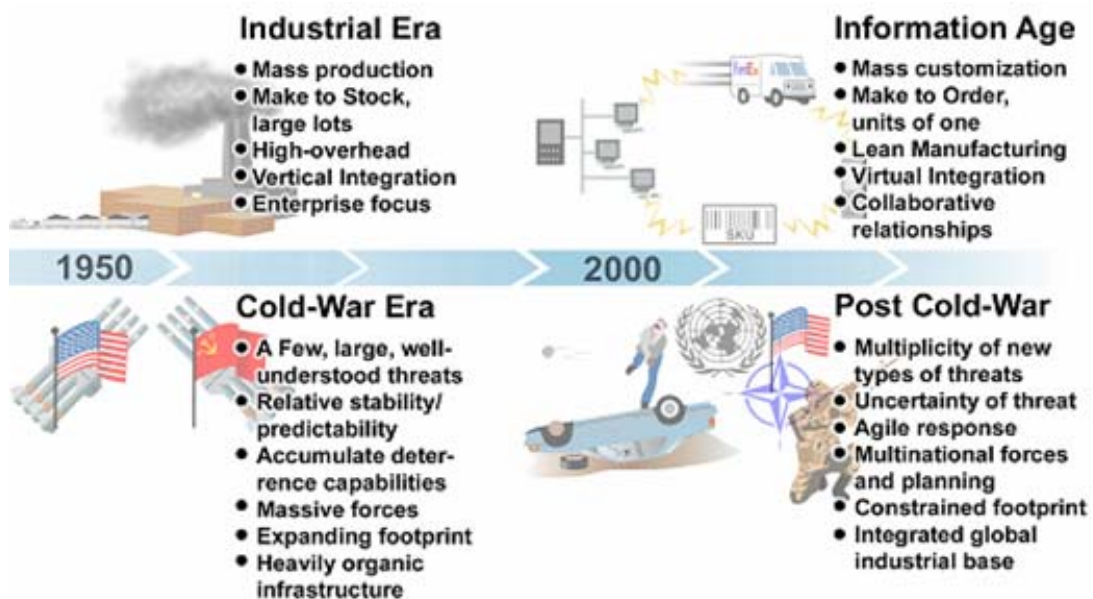


Figure 1. DoD Logistics Transformation (FLE, 2002)

The primary objective of the FLE is to ensure consistent, reliable support that meets warfighter requirements of end-to-end customer service. The FLE builds upon and accelerates specific, ongoing Service and Agency initiatives to meet the requirements of the Quadrennial Defense Review (QDR) and the National Defense Strategy. The six FLE initiatives are shown in Figure 2.



Figure 2. Logistics Initiatives (FLE, 2002)

These programs are integrated and inter-dependent, with synergies and cumulative benefits. The first initiative is about sharing information with the private sector through a Total Life Cycle Management approach that will net gains in research and development, reduced cost in procurement and maintenance, and improved service responsiveness. By focusing on improving processes across the entire system the military can gain improvements in facilitating materiel to the warfighter outside the CONUS where the materiel may be needed the most. To narrow the scope to the single process of frustrated cargo, the Under Secretary of Defense for Acquisition, Technology and Logistics has published a memorandum and set of “Business Rules” (see Appendix

B). Within frustrated vendor cargo there is a subset: hazmat cargo. This type of cargo has additional transportation and safety restrictions governed by military, federal, and international requirements. This memorandum stresses the FLE goals and the concern of frustrated vendor shipments and states "...all shipments that enter the Department's organic distribution system shall comply..." (USDATL, 2003).

The business rules address several critical items needed to ensure that hazardous material vendor cargo can pass easily through the DTS, including: Military Shipping Label (MSL), "ship to" and "mark for" addresses, Transportation Control Number (TCN), Material Safety Data Sheets, and appropriate hazmat packaging. The memo and business rules were distributed to all secretaries of the military departments, directors of defense agencies, and DoD field agencies. The USDATL memo's business rules are appropriate and offer assistance to vendors shipping within the DTS. Dover AFB's aerial port has had the opportunity to provide these to many vendors who stated they had not heard of them (Dover AFB, 2004). This memo however, may not go far enough in communicating the need to vendors and purchasers that hazardous material shipments need to be prepared to meet transportation requirements to their final destination.

A close look at the "Business Rules" shows the potential for holes and misplaced responsibility. First, the Business Rules are addressed as "vendors must"; the responsibility might need to be shared between Transportation Officer (TO), purchaser, and vendor, who represent the transportation expert, customer, and supplier/shipper (respectively). Next, the business rules might need to make either the TO or purchaser responsible for communicating all modes of transportation required and final geographic

location the shipment will be delivered to passing the responsibility for compliance then to the supplier/shipper.

The memorandum also states that for overseas shipments the host geographic country address (if available) and APO/FPO address must be included. If the geographic location cannot be given, a shipment that is entering the DTS may not be prepared and packaged to meet all modal and host nation requirements; either because a vendor did not understand the APO/FPO requirements, was not given enough information, or was only given only given the address of the stateside aerial port. This is particularly important to hazmat shipments, which must meet strict requirements of the specific transportation mode and countries it may transit (USDATL, 2003).

Lastly, the rules require advance shipping notice be provided to the first point in the DTS, however there are no standard or mandatory measures in place to facilitate this. The Navy Smart Transportation Solution (STS) and DLA offer web based tools (and AFMC has one under development: Virtual Vendor Help Desk) to facilitate this, but these website addresses are not provided, nor are they mandatory (DPO, 2004). Further steps may need to be required with an emphasis on the three necessary functions collaborating to complete the transaction.

The Air Force's (AFMC) Virtual Vendor Help Desk website is planned to be a one-stop shop which brings together purchaser, vendor, and transportation officer. Figure 3 below shows the opening webpage which will allow each person to take the appropriate steps based on their role in the GPC purchase transaction. It plans to provide process and procedures for shipments, allow printing of the MSL, and generate the shipment request

(ATCMD). The site is projected to be operational in August of 2004 (USTRANSCOM, 2004). The Navy's STS is partially operational, providing web-based automatic addressing and shipping documentation (including the MSL), and in-transit visibility by communicating with the Global Transportation Network making it easier for the Navy's materials to enter the DTS (Navy, 2002).

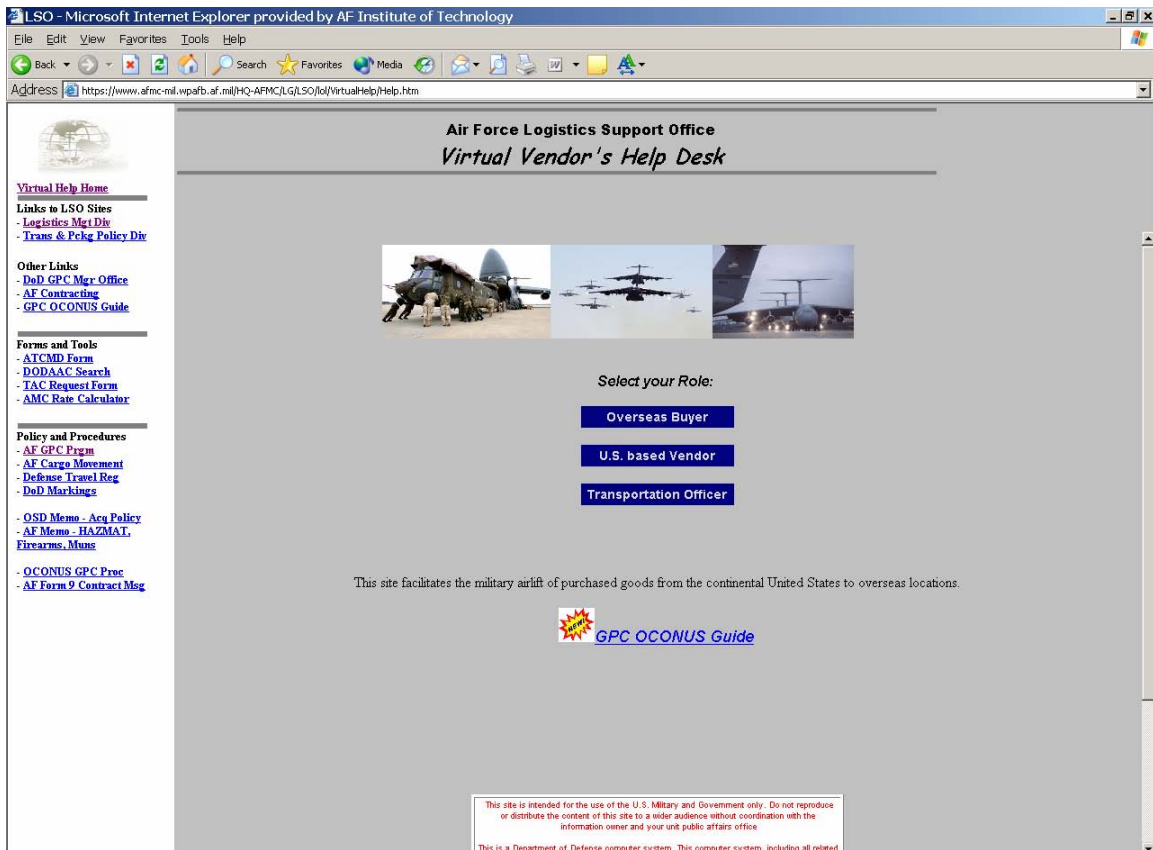


Figure 3. Virtual Vendor Help Desk Website (AFMC, 2004)

Government Purchase Card

The DoD Government Purchase Card program is managed by the Office of the Under Secretary of Defense, Acquisition, Technology, and Logistics (USDATL) and its Purchase Card Program Management Office (PMO). The PMO establishes annual

training and documentation requirements, oversees the program, and includes representatives from all military services on its staff. The PMO website contains current and relevant information, including the USDATL memo addressing acquisition policy on facilitating vendor shipments in the DTS and the Business Rules for vendors (USDATL: 2003).

The Air Force specific instructions are contained in AFI 64-117, Air Force Government-Wide Purchase (GPC) Program. The AFI details the program, which is based on a six level reporting hierarchy (AFI 64-117: 5):

Level 1: The first level represents the Department of Defense as a whole. The DoD Purchase Card Joint Program Management Office (PMO) serves as the Level 1 reporting agency for the DoD.

Level 2: This level identifies the military service. SAF/AQC is the Level 2 reporting agency for the Air Force. A SAF/AQC staff member is designated as the focal point for the GPC Program and serves as a liaison among Air Force organizations, the Bank, the DoD Purchase Card Joint Program Management Office, and the General Services Administration. Primary responsibilities include Air Force GPC policy and program support for OSD, Headquarters Air Force, and Air Force MAJCOMs.

Level 3: The third reporting level identifies the MAJCOM/Agency. Primary responsibilities include implementation, administration, and monitoring of the MAJCOM GPC program subject to DoD and Air Force policies, liaison between SAF/AQC, the Bank, MAJCOM staff, and field organizations, and program support to MAJCOM and installation GPC focal points.

Level 4: The fourth reporting level identifies the installation/organization; referred to as the Agency/Organization Program Coordinator (A/OPC). Primary responsibilities are program implementation and administration, training and monitoring at the installation level, and serving as liaison between the MAJCOM, the Bank, Financial Services Officer (FSO), and installation organizations.

Level 5: The fifth reporting level identifies the particular organization authorized to use the GPC. Each organization appoints an approving official and primary responsibilities include GPC administration for the organization, including approval/disapproval of all purchases subsequent to reconciliation by the cardholder,

funds accountability, and surveillance of all cardholders within the approving official's account.

Level 6: Identifies the individual cardholder; primary responsibilities include making authorized transactions, logging and reconciliation of transactions, and approval of all valid transactions made in support of organizational requirements.

The purchase card can be used to purchase authorized supplies and equipment (certain restrictions apply) up to the individual purchase limit of \$2,500 for CONUS; authorization and training can increase the limit to \$25,000 for overseas cardholders provided the purchase is for use outside the United States (AFI 64-117, 2002). It is recommended for purchases that have an ongoing requirement that a contract be established through the base Contracting Office. The Contracting Officer can use the GPC for payment on contractual items. Cardholders may make purchases on-line provided they have received authorization through their internal agency or Organization Program Coordinator, level 4 (AFI 64-117, 2002).

The majority of established GPC guidance and attention is placed on purchase limits, prohibited purchases, and fraudulent use of the card. There is guidance about prohibited purchases, such as munitions/weapons: the GPC shall not be used for the purchase of hazardous/dangerous items such as explosives, munitions, toxins, and firearms, this specifically includes weapons, small arms, and ammunition (AFI 64-117, 2002: 10).

Air Force guidance states that Base Hazardous Materials Management Process (HMMP) Team approval must be obtained before hazardous or potentially hazardous material may be purchased by any means or brought onto an installation (7).

Additionally, GPC holders are referred to AFI 32-7086 (Hazardous Material Management) and local guidance when considering making a vendor purchase that contains hazardous material. AFI 32-7086, para. 2.3.4., details a HAZMAT authorization process but states “this authorization process does not apply to contractors using HAZMAT while operating on Air Force installations with HAZMAT obtained from non-Air Force Sources of Supply). All hazmat purchases using the IMPAC (GPC has replaced the IMPAC) will be entered into a tracking system that the MAJCOM CE will field” (AFI 32-7086, 7). The AFI 32-7086 states that the installation hazmat pharmacy program will enter all authorized hazmat requests into the tracking system and that local IMPAC procedures include the requirement that all purchases of HAZMAT require the prior approval and process described within (16). According to Air Force Instruction, GPC training requirements include hazardous materials, however, further information on this training appears lacking and no other mention of hazardous material purchases are present in this Air Force instruction. Furthermore, there are no established guidelines for deployed operations or transportation requirements for GPC purchases of hazmat.

The current DoD GPC Concept of Operations, updated 31 Mar 2003, states that pre-purchase approval may be required for special use items, referring to hazardous material and other items, and that these are approved by the local authority (PMO, 2004). The Army’s GPC Standard Operating Procedures, 31 July 2002, mirror the DoD attention placed on hazmat purchases (PMO, 2004). Explanation of hazmat purchases, organic transportation requirements, and local authority is not addressed in either document.

More recently, special attention has been given to purchases being shipped overseas due to the added complexity of transportation and funding requirements. When these shipments contain hazardous material, even more transportation restrictions are imposed. When it is impossible for the vendor to deliver purchased items directly to the end user (normally referred to commercial door-to-door delivery) the purchase will enter the DTS. Various guides explain responsibilities and procedures for both the purchaser and vendor to follow to achieve the quickest delivery process possible (PMO, 2004). When required shipping information is incorrect or lacking, the shipment usually becomes frustrated at the military port prior to reaching its final destination. Many times the shipment never reaches its intended recipient (PMO, 2004).

The USAF/ILT office sited in 2000 that the most common reason that vendor purchases become frustrated at aerial ports is due to incomplete paperwork or no paperwork at all. It goes on to emphasize hazardous material declarations and that it not the responsibility of the aerial port to bring shipments into compliance with air transportation requirements (The Transformer, 2000). In order for a vendor shipment to move within the DTS it must have a military shipping label (MSL). The MSL will have the following key pieces of information (which need to be provided to the vendor):

Transportation Control Number (TCN): A 17 character alphanumeric that identifies the shipment with the DTS.

From: The return address of the vendor.

Transportation Account Code (TAC)/Type Service/Postage: The TAC indicates the funding source for transportation of the shipment within the DTS.

Piece_of_: Indicates the box number and total number of boxes in shipment.

Weight: Weight of package (provided by vendor).

Date Shipped: Can be left blank or provided by vendor.

RDD: The Julian “required delivery date” the user needs the item.

Cube: The actual size (volume) of the package.

Project: Project codes are used to identify special programs and for tracking associated costs (unit TO will determine if a project code is applicable to the shipment).

Ship-To POE.In-The-Clear Address: Address of the point where the shipment will enter the DTS (seaport or aerial port).

Priority: This determines whether routine or expedited transportation service is authorized.

POD: The OCONUS water or aerial port at which cargo will be delivered; not necessarily the end customer (onward movement from the POD may be required making consignee address and delivery information critical).

Ultimate Consignee: The organization to receive the shipment; identified by a DoD Activity Address Code (DODAAC) and a clear text name and shipping address.

In addition to the MSL, an Advanced Transportation Control Movement Document (ATCMD) is required (AFMAN 24-204, 2001). This document notifies the POE that a shipment is coming to them and is a method of transmitting information.

Air Force Material Command Logistics Support Office (AFMC LSO) maintains a website which allows creation of a MSL and an option to transmit the ATCMD (AFMC/LSO, 2004). This website is useful for the purchaser and aerial ports because it allows critical (and often omitted) information to be transmitted regarding shipments. The use of this website is not required nor will it eliminate all mistakes. If the customer

(purchaser) is aware that their shipment contains hazardous material, it offers specific suggestions for information to be entered.

Each military department is charged with training GPC holders. At the local level, Air Force contracting squadrons are responsible for establishing GPC accounts as well as for maintenance and surveillance of those accounts, and training. A review of required on-line training provided by the Defense Acquisition University yielded no mention of coordination with transportation officers for OCONUS deliveries and little mention of hazardous material purchases: only that pre-approvals may be required for certain categories of services/supplies such as chemicals/paints/hazardous material among others (DAU CLC, 2004). Top level instructions and guidance for military services and other DoD authorized purchasers appears to be lacking. Roles and responsibilities of the purchaser, vendor, and transportation officer and transportation requirements and restrictions for purchases entering the DTS need to be addressed, and coordinated, at the service level. However, during a brief, dated June 2003, the Air Force Contracting Office identified a list of proposed metrics; one of which was “Percentage of “frustrated freight” resulting from purchase card shipments” (SAF/ACQ 2003). Capturing frustrated vendor cargo metrics is difficult but the focused efforts through current studies and IT programs/solutions aimed at facilitating this information are underway.

Along with the increased attention on the problem of frustrated vendor cargo, guides and policy letters have been posted on the PMO website to facilitate the flow of necessary information between purchaser and vendor. According to the *Frustrated*

Freight Guide preface, when commercial shipping is not used, you [GPC holder] must coordinate with your transportation service support office, i.e. Installation Transportation Office (ITO), Transportation Management Office (TMO), Supply Support Activity (SSA), etc., before you order your item from the vendor (Frustrated Freight Guide, 2004).

However, in step 3 of the guide, you do not need to contact the transportation support office if you have the required shipping instructions. The guide states that “if you need assistance” with arranging transportation to contact your transportation office; this language clearly does not require a GPC purchaser to contact the TO (Frustrated Freight Guide, 2004). The cardholder may believe they have all the correct information to complete a successful transaction with a vendor; the GPC holder may have completed many successful transactions in the past but if dealing with a new vendor or purchasing items that contain hazardous material, additional steps may need to be completed to ensure a successful delivery. Additionally, there may be new or changed information, such as funding or consignee codes that purchaser will need (obtained from the TO). If the purchaser or vendor has the capability or thinks they have the capability collaboration may not take place.

Without clear involvement from the TO, in some form, frustrated vendor cargo (in particular hazardous cargo) will continue to rise as the use of the GPC rises. This guide is much more inclusive than existing instructions but due to the nature of hazmat, funding, and transportation requirements the transportation service support office may need to become involved with each purchase entering the DTS. New and clearer language may also be needed and web based collaboration tools invoked to bring the

necessary parties together to execute a successful purchase and delivery; the purchaser, the vendor, and the supporting transportation office.

Hazardous Material

This review will not go into depth on hazardous material transportation requirements. It is assumed that military transportation officers, applicable aerial port personnel, commercial vendors, and all personnel that package, certify, or provide inspections and documentation for hazardous material are appropriately trained and qualified to perform their required duties. However, a general overview of the hazmat transportation requirements is warranted to provide a basic understanding of discrepancies that ultimately cause a GPC purchase to become frustrated within the DTS.

Transportation personnel must comply with public law, policy, agreements, and applicable international, federal, and military directives when processing, handling, and shipping hazmat (AFI 24-201, 2003). The shipper is required to certify that hazardous materials are properly classified, described, packaged, marked, labeled, and in proper condition for transport, this includes hazmat purchased with the GPC (AFI 24-201, 2003). AFI 24-201, Cargo Movement, specifically references the following regulations/guidance in regards to hazardous cargo movement:

Transportation, Title 49, CFR, Parts 100-199, and DOT exemptions: Contains criteria and requirements for classifying, describing, packaging, marking, labeling, shipping, placarding and transporting HM for commercial carriers by all modes/methods of transportation within the United States.

Environmental Protection Agency Regulations, Protection of Environment, Title 40, Code of Federal Regulations, Parts 240-267 and Part 761: Provides specific guidelines for management of hazardous wastes and substances.

Federal Motor Carrier Safety Regulations, Title 49, CFR, Parts 390-399:

Contains regulations on matters affecting safety in transport over public highways. Includes specifications for vehicles and drivers.

International Air Transport Association (IATA) Dangerous Goods

Regulations: Includes restrictions that apply to the acceptance of such articles by participating carriers. Provides detailed procedures required by ICAO.

International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transportation of Dangerous Goods by Air:

Contains detailed instructions for safe international transport of dangerous goods by air.

International Maritime Organization (IMO), International Maritime Dangerous Goods (IMDG) Code:

Provides detailed instructions for safe international transport of hazardous material by sea.

North American Emergency Response Guidebook, RSPA P 5800.7:

A guidebook developed by DOT for first responders during the initial phase of a hazardous materials/dangerous goods incident.

Joint Hazard Classification System (JHCS): This is the official DOD hazard classification database of ammunition and explosives. The U.S. Army Technical Center for Explosives Safety (USATCES) manages the JHCS for the Department of Defense Explosives Safety Board (DDESB). The JHCS contains hazard classification data for the Army, Navy, and Air Force.

T.O. 11A-1-46, *Firefighting Guidance, Transportation, and Storage Management Data*. DOD 4160.21-M, *Defense Materiel Disposition Manual*:

Provides guidance for handling, processing and disposing of government property.

DOD 6050.5-L, *Hazardous Materials Information System (HMIS) Item*

Listing: Lists DOD hazardous materials, by the last nine digits of the National Stock Number, for all services and contains information on how to handle, store, use, transport, and dispose of HM.

AFI 40-201, *Managing Radioactive Materials in the US Air Force*.

AFJI 23-504, *Radioactive Commodities in the DOD Supply System*: Provides DOD policy guidelines on controls and specific handling responsibilities for radioactive items.

AFJI 24-210, *Packaging of Hazardous Material*.

AFMAN 24-204(I), *Preparing Hazardous Materials for Military Air Shipments*: Provides specific guidelines and instructions for preparation, packaging and documentation of hazardous materials for military air shipments.

AFPAM 32-7043, *Hazardous Waste Management Guide*: Provides specific transportation requirements for hazardous waste.

Regulations covering the packaging, identification, handling, and security of hazmat are referred to as Hazardous Materials Regulations (HMR). The HMRs are designed to ensure that hazmat are packaged and handled safely during transportation, thus minimizing the possibility of their release should an incident occur and to effectively communicate to carriers, transportation workers, and emergency responders the hazards of the materials being transported.

Hazardous materials are classified into nine general classes according to their physical, chemical, and nuclear properties, as follows:

Class 1—Explosives

Class 2—Compressed, flammable, nonflammable, and poison gases

Class 3—Flammable liquids

Class 4—Flammable solids

Class 5—Oxidizers and organic peroxides

Class 6—Toxic and infectious materials

Class 7—Radioactive materials

Class 8—Corrosive materials

Class 9—Miscellaneous dangerous substances and articles

There are further divisions within classes 1, 2, 4, 5, and 6. (CFR 49, 2003).

Many military units, and vendors, are faced with increased need and exposure to items that contain hazardous material and are subject to requirements and restrictions when transported within the DTS. Packaging, quantity and transportation restrictions, and other requirements change with each hazardous material class. DoD agencies and companies must maintain sufficient knowledge of handling, marking, documentation, and packaging requirements to ensure the smooth flow of goods through any transportation network.

There are several requirements and responsibilities that rest with a hazmat shipper (vendor) before material can be shipped. If not accomplished, these requirements can cause the shipment to become frustrated within the DTS. In general these requirements and their DLA definitions are (49 CFR Part 173, 2003):

PROPER SHIPPING NAME (PSN) - standard name used in the transport of dangerous goods to identify the dangerous article or substance on the outside of the package and on the shipping papers; Proper Shipping Names are listed in the Hazardous Materials Tables in all modal regulations.

CLASS OR DIVISION - number assigned to the article or substance according to the criteria of one or more of nine UN hazard classes.

SHIPPING PAPERS - shipping orders, bills of lading, manifests or other shipping documents serving a similar purpose and containing hazardous materials descriptions and shipper's certification.

CERTIFICATION - the act of confirming that a completed package, marking inclusive, meets the requirements of UN Performance Oriented Packaging.

COMPATIBILITY TEST - test to assure that the plastic material used in the manufacture of plastic drums, plastic jerricans, and plastic composite packagings in direct contact with the hazardous material is resistant to chemical reactions.

MARKING - descriptive name, identification number, instructions, cautions, weight, specification, or UN marks, or combinations thereof, required on outer packagings of hazardous materials.

PACKAGINGS - receptacles and any other components or materials necessary for the receptacle to perform its containment function.

When a GPC hazmat purchase is made, the vendor has two shipping options:

either the vendor takes responsibility for all shipping arrangements or the shipment enters the DTS. In either case the vendor is responsible for ensuring that all documentation and packaging requirements are met for all modes of transportation. The Air Force Interservice Manual 24-204, Preparing Hazardous Materials for Military Shipments implements and addresses requirements for transporting hazardous material. This manual refers to and incorporates applicable 49 CFR and ICAO instructions. It also gives appropriate guidance to not transport any damaged, leaking, or improperly packed, marked, labeled item or material (AFMAN 24-204, 2001). It goes on to say to return shipments to the originator, at originator's expense, when a shipment requiring UN specifications containers is not packaged properly and to ensure applicable modal requirements are met when offering any shipment for transportation. The urgency of need should be considered when determining the best method for correcting a deficient shipment (AFMAN 24-204, 2001: 6). This consideration places some responsibility (or potential responsibility) on the APOE (i.e. aerial ports) to correct some discrepancies, when possible, themselves when a shipment is considered urgent enough.

The TO is the single-manager for all of an installation's cargo movements (except those moved directly by individual units) and this includes GPC shipments (AFI 24-201, 2003: 9). If the shipment must move within the DTS, the ordering unit's base TO will

assist by providing information on customs clearance, packaging, marking and DTR, Part II, documentation/advance clearance requirements for the vendor to follow (AFI 24-201, 2003: 52). In this process, additional and more explicit directives would benefit all GPC purchasers (especially those hazmat purchases). Currently, there are limited and superficial connections between GPC and (hazardous) cargo movement guidance, reducing the chances for the cardholder and vendor to have a successful transaction.

Current Research

Current studies and pilot projects reinforce the relevance of this research. In line with the military's current trend towards transformation, the DoD has designated the commander of USTRANSCOM as the Distribution Process Owner (DPO). The DPO is charged with improving the efficiency and interoperability of distribution related activities (deployment, sustainment, and redeployment) during peace and war (USSECDEF, Sep 03). As part of the DPO charge, USTRANSCOM has established multiple initiatives; the Direct Vendor Delivery Process Integrated Process Team (referred to as the IPT) is specifically looking at reducing the number of frustrated vendor purchases. The IPT is made up of representatives from USTRANSCOM, the DoD Purchase Card PMO, the Office of the Assistant Dep Under Secretary of Defense for Transportation Policy, HQ DLA, Joint Forces Command, HQ US Navy and Marines, General Services Administration (GSA), the Logistics Management Institute, and the Computer Sciences Corporation (DPO, 2004).

The IPT has accomplished an unpublished snapshot study, which gathered two weeks of frustrated vendor cargo data at Travis, Dover, and Charleston Air Force Bases

aerial ports. Over a two week period 351 data points (frustrated pieces of vendor cargo) were collected. The majority of the frustrated cargo was observed at Dover AFB and 12, or 3.5%, of all frustrated shipments were hazardous material-type (7, or 58.3% of all frustrated hazmat vendor shipments occurred at Dover AFB) (DPO IPT, 2004). The study attempted to capture the causes of frustration, consignee, military service, vendor, GPC purchase (versus contract/GSA). This study, while limited in number of frustrated hazardous samples, indicates that a high percentage of the frustrated shipments are lacking the MSL, bar codes, and mark for addressing; only two of the 12 observations had those items correct, see Table 1. While the majority of shipments are marked “No”, under the GPC column, indicating that they were not purchased with a GPC; the purchase method: whether an item is purchased using the GPC or contract may not be significant. Both types of purchases are bound by the same transportation requirements and in some cases contract agreements are purchased using the GPC, so it is not always evident which purchase method was used.

Table 1. Frustrated Hazmat Vendor Shipments (DPO IPT, 2004)

| Shipment # | GPC | Aerial Port | ATCMD | MSL | Bar codes | Mark For |
|---|-----|-------------|---------------|---------------|---------------|---------------|
| 1 | No | CHS | No | No | No | No |
| 2 | No | DOV | No | No | No | Yes |
| 3 | No | DOV | Yes | Yes | Yes | Yes |
| 4 | No | DOV | No | No | No | No |
| 5 | No | DOV | No | No | No | Yes |
| 6 | No | DOV | Yes | No | No | Yes |
| 7 | No | DOV | No | No | No | No |
| 8 | No | DOV | No | No | No | No |
| 9 | Yes | CHS | No | No | No | No |
| 10 | No | CHS | Yes | Yes | Yes | Yes |
| 11 | No | DOV | No | No | No | No |
| 12 | No | SUU | No | No | No | No |
| % Frustrated Due to Discrepancies: | | | 75.00% | 83.33% | 83.33% | 58.33% |

The IPT has also established a pilot study CONOPS (draft) that will select GPC purchasers and vendors who will conduct purchases using EMall and/or GSA Advantage. EMall and GSA Advantage website portals use the internet to offer buyers a single access point for procuring off-the-shelf, finished goods from commercial and government suppliers.

The study's objective is to improve the control and management of cargo generated by GPC activity by testing the feasibility of using government off the shelf (GOTS) tools in conjunction with interim process changes (DPO, 2004). Customers and vendors will interact with one of two Service vendor distribution support systems (either the Navy's Smart Transportation System or the Air Force's Virtual Vendor). These systems provide shipment and planning, and documentation support (including MSL printing and ATCMD). The study includes only those GPC shipments going through the air DTS to OCONUS locations and assumes vendors have web access and are registered/listed on either GSA Advantage or DLA's EMall (or agree to be registered). They must also agree to the pilot study business rules (not yet available) (DPO, 2004). Currently it is unclear if the Army or Marines will participate in this study, projected to begin in Sept 04 (DPO, 2004).

Summary

“DoD must reduce its logistics response times, logistics footprint, and logistics infrastructure to reengineer its logistics system to better match the warfighting concepts of the 21st century” –Paul G. Kaminski, Under Secretary of Defense for Acquisition and Technology (Kaminski, 1996).

The pervasiveness and benefits of the GPC program and the necessary evolution of efficient logistics operations have created critical friction points within the military supply chain where vendor products enter the DTS. By modifying or introducing measures aimed at eliminating the errors that cause vendor cargo to become frustrated the velocity of vendor cargo to the warfighter and military capabilities can be increased. Explicit inclusion of the TO roles and responsibilities in GPC and hazmat transportation directives is lacking regarding vendor hazmat purchases entering the DTS. Expansion of the TO's role in this transaction and the introduction of web-based collaborative tools may provide the best opportunity to reduce or eliminate the most common causes of frustrated vendor cargo and allow for growth and changes to be introduced in a more seamless fashion as the need arises. However, further analysis of instances of frustrated cargo within the various modes of the DTS need to be accomplished in order to understand the extent of the problem and areas that need attention. The next chapter establishes a research methodology roadmap designed to identify the discrepancies and causes of frustrated hazmat cargo.

III. Methodology

Chapter Overview

This research focuses on hazardous shipments obtained directly from a vendor (usually through individual or micro-purchases, or an established contract and normally purchased with a GPC) entering and becoming frustrated at aerial ports. The aerial port studied, at Dover AFB, is considered the main hub for cargo going overseas to warfighters in Europe and the Middle East. Current research and attention to this type of frustrated cargo have mentioned the lack of existing data or metrics. The lack of data is a result of the challenges and difficulties of collection and increased use and ease of GPC purchases. In the past, occurrence of this type of frustrated cargo may have been small and overlooked or determined not significant due to a low incident rate. In light of overall increased vendor purchases, the current focus on this problem, lack of past research, and at least one (possibly two) other study(s) collecting applicable data; this research includes a case study with interviews, and data from other studies. These data are compared to quantify and qualify the extent to which vendor purchased cargo is becoming frustrated and the impact on the units required to correct the discrepancies and awaiting their delayed cargo.

Problem Statement

The goal of this research is to identify/quantify the problems that cause hazmat vendor cargo to become frustrated upon entering the DTS at a major aerial port. Additionally, an analysis of current policy and guidance that addresses GPC purchased vendor cargo within the DTS should yield areas where material is lacking or

improvements can be made. This approach should provide potential solutions and areas where the most improvements in reducing frustrated cargo can occur, thus increasing the speed in which GPC purchasers/warfighters receive their shipments.

To address this problem the following investigative questions, presented in chapter one, are be answered:

1. What is causing the GPC purchased hazmat cargo to become frustrated at an aerial port?
2. How many shipments were frustrated and how long were these shipments delayed at the aerial ports?
3. Does the GPC cardholder training adequately cover the purchase and transportation restrictions of hazmat?
4. What improvements in written guidance or training can be implemented to reduce or eliminate frustrated vendor shipments?
5. What additional measures can be (need to be) implemented to improve the communication and understanding of transportation requirements between GPC cardholders and vendors to facilitate moving a hazmat purchase to the end customer?

Method

A case study can be defined as an empirical study that investigates a contemporary phenomenon within its real-life context, when the boundaries may not be clearly evident (Yin, 2003: 13). Yin goes on to provide other definitions and explains that there may be many more variables of interest than data points, relies on multiple

sources of evidence, and benefits from prior development of theoretical propositions to guide the data collection and analysis (Yin, 2003: 14).

The phenomenon of frustrated vendor cargo has many moving parts and multiple roles and responsibilities that must be accomplished, often by separate individuals and in isolation. This research will not cover all aspects or attempt to provide “the” solution. But will present the data collected in attempt to quantify the frequency of occurrences and expose potential shortfalls in policy and guidance.

When attempting to determine “how” and “why” type questions or explain a phenomenon, Yin suggests that case studies, histories, and experiments are preferred research strategies (Yin, 2003: 6). To fully answer the research question, current studies and other available data sources will also be analyzed. This additional analysis will quantify the extent that vendor purchased hazmat cargo is becoming frustrated, while the case study will dig deeper answering several of the investigative questions.

Case study research requires a road map starting with determining the type of case study (multiple or single) and the number and type of units of analysis to data collection and analysis. Yin lays out this road map as the case study design which is comprised of components: 1. a study’s questions; 2. its propositions, if any; 3. its unit(s) of analysis; 4. the logic linking the data to the propositions; and 5. the criteria for interpreting the findings (Yin, 2003: 21).

This case study will be a single case design with multiple (or embedded) units of analysis. The first component of Yin’s design is the research question. The next component, propositions of the study, is the investigative questions; these direct or focus

the efforts of this research. The third component, unit(s) of analysis, defines what the “case” is (Yin, 2003: 22). The units of analysis are the frustrated vendor cargo and quality/completeness of GPC training and guidance. The investigative questions are designed to collect information about these two units of analysis.

The last two components of case study design, logically linking the data to the propositions and the criteria for interpreting the findings, lay the foundation for data analysis and conclusions (Yin, 2003:26). To link the collected data to the propositions, the summaries, interview responses, and other data sources is tabulated, placed into categories and presented. The criteria for interpreting these findings will be somewhat subjective in nature. The actually findings will be more straight forward but the degree these findings are significant or acceptable will depend on the potential for improvements and opinions of those persons in the leadership of the DoD. Yin points out the challenges in interpreting case study results and the lack of statistical tests (2003). This research will attempt to develop patterns and find specific causes and solutions to this frustrated cargo.

Data Sources

Dover AFB operates the major east coast aerial port. Most of the cargo bound for Europe and the Middle East are routed through this port and transported by AMC or AMC contracted aircraft. For this reason and expert advice from various persons involved in the DPO IPT and logistics functions within HQ AMC and HQ AFMC, Dover was chosen as the best representative port to collect this type of data. In a two week snapshot study which collected information on all frustrated vendor cargo during that period, Dover had 152 data points compared to Charleston’s 101 (DPO IPT, 2004).

Case study data typically come from one or more of the following: documents, archival records, interviews, direct observation, participant-observation, and physical artifacts (Yin, 2003: 83). This characteristic of case studies allows the synthesis of multiple data sources. The Dover aerial port study will include interviews, archival records, and direct observation.

Data from other sources, including the two-week snapshot study will also be analyzed. The two-week study was conducted by the DPO IPT and yielded an aggregation of frustrated vendor cargo from Travis, Charleston and Dover AFB aerial ports. The data is presented in a Microsoft Access database and will be compared to the archival data that is obtained (DPO IPT, 2004).

Data Collection

Case Study

Data will be collected through interviews, archival data analysis, and observation. The observation portion will reveal both planned and unplanned realizations. The researcher visited the Dover AFB aerial port, spending two days with the Customer Service Branch which deals directly with vendor shipments entering their port. They are faced with frustrated cargo on a daily basis and are instrumental in correcting the discrepancies of the frustrated cargo and making efforts to assist users of the DTS (both vendors and purchasers) through ongoing education and advice.

Interviews

Open-ended interviews will be conducted and tailored for two different groups of individuals involved with the initiation and success of moving hazmat cargo.

1. Aerial Port Personnel-those personnel employed and located within an AMC aerial port and working directly with frustrated hazmat vendor cargo. These persons are directly involved with identifying, and working with vendors and purchasers to correct, discrepancies causing cargo to become frustrated.
2. GPC Cardholders-Military GPC holders who purchase (hazmat) supplies that originate from vendors in the CONUS, enter the DTS, and are shipped to the end user OCONUS.

Open-ended questions will allow the respondent to express their own opinions and ideas but will maintain some structure in that the questions are standardized and prepared before hand. Specific questions will be posed to successfully realize the extent of the problem, possible process weaknesses, and solutions. The interview questions can be found in appendix A. Only one interviewer, the researcher, is planned for this research. This will minimize the effects of different evaluation instruments and variation among interviewers. The researcher will be able to read the questions in the same manner for each interviewee, thus minimizing variation in interpretation. Interviews were conducted both in person and by telephone and email. Excluded here, but still key to the success, are other critical groups such as vendors and transportation officers.

Interviews were conducted with Dover's aerial port Customer Service Branch. These personnel deal directly with vendor cargo, customers (GPC holders), and vendors. If vendor cargo becomes frustrated, this office contacts the vendor or customer to correct the problem; they also field many calls and questions from vendors and customers regarding cargo and requirements. Three interviews were conducted: first was the Chief

of Customer Service; this person deals directly with the leadership within the squadron as well as outside agencies and is exposed to the problems this research addresses; the other two aerial port interviews were with persons in service liaison and traffic management roles. These personnel were chosen partly for association with other than Air Force service components and because they are exposed to issues such as air clearances and funding requirements. All aerial port personnel were considered subject matter experts in air transportation of cargo. Their exposure and experience to GPC requirements was somewhat limited and they could only offer ideas and generalizations to interview questions regarding specific GPC training and recommendations.

It proved difficult to obtain interview responses from GPC holders who are actively making purchases. These personnel are deployed overseas and may not always know the status of their vendor purchases. In a discussion with AFMC HQ Logistics Office personnel, the researcher learned that one deployed unit preparing to redeploy (return from their deployment) was satisfied with receiving half of all vendor purchased items. Two interviews were obtained from GPC holders. These individuals are both in deployed contracting squadrons and have had little problems with frustrated hazmat purchases but did provide insight into improvements that can be made to current GPC guidance and training. Additional interviews and research into the results of GPC purchased cargo, and GPC training from the GPC holder's point of view would strengthen the research and may provide the best insight into the best solutions to combat the causes and deficiencies found in this research. Focusing on the deployed GPC holder will also better quantify the problem and the impact of the cargo becoming frustrated.

Archival Data Analysis

The research will include recent raw data on frustrated vendor cargo. Dover's aerial port enters data on each frustrated piece of cargo; including vendor shipments. Hazardous material shipments are identified within this database as well as reasons for frustration and duration of frustration. This data will be aggregated to look at the frequency of each frustration reason and the time it took to correct the problem.

Observation

Direct observations will be captured through notes and recall. Often the tacit skills acquired through an individual's experience are not written down or easily and logically presented to an interviewer or others trying to learn a task. These observations will be used to validate other sources of information and to synthesize results and draw conclusions.

Existing/Current Studies Data

Two additional studies have collected data concerning the topic. These will prove useful in validating the results of the case study and identifying the full extent that hazmat cargo is becoming frustrated. The first study was accomplished by the DPO IPT and has taken a "snap shot" of frustrated vendor cargo (including and identifying hazmat type shipments) at Dover, Charleston and Travis AFBs. This unpublished study is part of a USTRANSCOM initiative concerned with the Direct Vendor Delivery process; the IPT was formed in March of 2004. Another study (falling under the same DoD DPO) is an Active Performance Management (APM) study that is to focus on frustrated cargo during a 90-day study at Dover and Charleston. The results of this study will not be completed

in time to be included here but may prove useful in the future. It will be accomplished with Blue Agave's Active Performance Management™ (APM) suite. This software is designed to look at operating problems in real-time, and root-cause analysis that enables continuous improvement (Blue Agave, 2004).

Research Design/Validity

As with any research method, confidence in results and interpretation will be based on a quality research design, and accurate data collection and interpretation. Case study design and research is no different. Yin offers tests and their tactics that can be conducted to establish: construct validity, internal validity, external validity, and reliability in the research design (Yin, 2003). These tests, tactics, and research phase are presented in Figure 4.

| Tests | Case Study Tactic | Research Phase in which tactic occurs |
|---------------------------|--|--|
| Construct validity | Use multiple sources of evidence | Data collection |
| | Establish chain of evidence | Data collection |
| | Have key informants review draft case study report | Composition |
| Internal validity | Do pattern matching | Data analysis |
| | Do explanation building | Data analysis |
| | Address rival explanations | Data analysis |
| | Use logic models | Data analysis |
| External validity | Use theory in single-case studies | Research design |
| | Use replication logic in multiple-case studies | Research design |
| Reliability | Use case study protocol | Data collection |
| | Develop case study database | Data collection |

Figure 4. Case Study Tactics for Four Design Tests (Yin, 2003)

Each test is defined below and the practical application of the tactic to this case study follows (Yin, 2003: 34):

Construct Validity-establishing correct operational measures for the problem being studied. This research will compare and aggregate data from multiple data sources. Additionally, a draft of compiled results and conclusions will be provided to the major data contributors for their review and concurrence. Common measures relating the various data sources will strengthen conclusions; this proves to be difficult especially

when dealing with archival data or sources where you have no control over how or what types of data are collected.

Internal Validity-is usually of more concern for experimental or quasi-experimental research. When research is causal or explanatory case studies or inferences during the study are made (i.e. the investigator has not directly observed a phenomenon but instead is inferring the cause effect relationship) then internal validity tests will apply. This research will attempt to limit specific explanatory results. Where applicable, the tactic of pattern matching will be applied. The frequency and reasons for hazmat vendor cargo frustration will be presented along with a review of the policy and guidelines that govern this process. This comparison will allow natural patterns and connections to emerge and thus reinforce the internal validity of the research design.

External Validity-addresses the domain to which the research findings can be applied. This study reviews a single case, the results can confidently only be applied under similar circumstances. Additional studies should be done to analyze other aerial ports both on the east coast and west coast as well as frustrated vendor cargo at sea ports and CCPs. By accomplishing and comparing such studies, bias results and extreme findings can be reduced and generalizations across various organic transportation modes and APOEs can be made.

Reliability-establishing repeatability within the various phases of the research, yielding the same results. To establish reliability this research uses multiple data sources and multiple month's data from the Dover aerial port. The results from each month and data source support the reliability of the research. Additionally, the literature and

military policy review carefully documents the specific document number and date of publication. Further and more comprehensive research could increase the reliability of the research by reviewing various policy and search for key words that bring the various critical components of the GPC purchase and deliver together.

Data Analysis

Collected data will be summarized and presented within its period of collection and then aggregated to provide results of the entire collection of data points. The lack of previous metrics and collected data will allow for multiple ways of presenting the data and challenges with incomplete and missing pieces of information. New metrics should be established by higher headquarters levels. Additional research into the appropriate importance or difficulty of correcting various discrepancies will lead to varying hierarchies of importance. Some of the raw frustrated cargo data provides the date the cargo was frustrated and the release date; this provides for the resulting number of days that the shipment was delayed at Dover's aerial port. The particular data was not available for July 2004 but should be considered a valuable measure of the responsiveness to discovered problems, of the amount of time elapsed between paying for goods and received by the end customer, and other metrics of interest.

The resulting interview responses and findings from the literature review will also be presented. These will yield areas where sufficient guidance is lacking or where, in the opinion of those interviewed, problems exist. Interpretations of raw data and reviewed literature are compared to find patterns and connections. These connections will show

the areas that provide the best areas to focus corrective and improvement efforts to reduce the overall occurrence of frustrated cargo (Yin, 2003: 116).

There are two units of analysis that the case study is interested in; they are the frustrated vendor cargo and quality/completeness of GPC training and guidance. The investigative questions are designed to collect information about these two units of analysis and the findings are summarized to answer each of the investigative questions.

Summary

This chapter describes the case study methodology used in researching the problems that cause frustrated hazardous vendor cargo within the air DTS and the current policy and guidance that addresses GPC acquired vendor cargo moving within the DTS. It presents key aspects of case study design and specific applications to address the quality of the research and how the investigative questions will be addressed. Of particular interest is the lack of research accomplished for this problem, various other research designs can and should be conducted to quantify the extent of the problem and search potential solutions. The following chapters present the findings, potential areas that need the most attention, and conclusions.

IV. Results and Analysis

Chapter Overview

This chapter presents results of the case study research from three sources: the literature review, interviews, and archival data. The investigative questions are addressed through analysis of the current policy and guidance that assist the GPC holder who needs to make a purchase that contains hazardous material entering the DTS at an aerial port, frustrated vendor cargo data provided from Dover AFB, a snapshot study conducted by the DPO IPT, and interviews with aerial port personnel and GPC holders.

Three different archival data sets were obtained: the snapshot study data from DPO IPT study and then two sets from the Dover AFB aerial port. The last two sets cover 12 months starting in April 2003 and June through mid-July 2004 respectively. These two sets were collected in different formats and in some cases data is missing or was determined to have been entered incorrectly. When obvious, incorrect data has not been included in the results. The metrics of interest are the length of time the hazmat shipment remained frustrated and the top causes of frustration.

Restatement of Research Question

What is the extent that GPC purchases of vendor hazardous material shipments are becoming frustrated upon entering the organic airlift transportation system and does the established guidance sufficiently address these types of purchases?

Investigative Question One

What is causing the GPC purchased hazmat cargo to become frustrated at an aerial port?

Data collected from Dover’s aerial port was aggregated to yield the top causes of frustrated hazmat vendor cargo. Table 2 shows the leading frustration discrepancies. The miscellaneous category includes reasons such as MSDS, incorrect information on various required forms, PSN, and markings. The clear top cause, causing 60% of the frustrated cargo, is no shipping papers or hazardous material declarations.

Table 2. Top Causes of Frustrated Vendor Hazmat Shipments

| Top Frustration Causes | |
|---------------------------------|-------------------|
| Cause | % of Total |
| No Shipping Papers/Declarations | 60.00% |
| Miscellaneous | 17.22% |
| No TCN | 7.78% |

The table 2, above, shows the aggregate of data collected at Dover from Apr 03 – Apr 04, Jun 04, and part of Jul 04. The individual data collection periods and the DPO IPT summaries are presented below. Since the DPO IPT study was conducted over a two week period, it was not able to collect the length of time a shipment remained frustrated. The lack of control and differences over how the data were collected as well as what items of interest to collect are apparent and do not allow for all data to be aggregated. The IPT data presented in Chapter 2 is recalled below in Table 3.

Table 3. Frustrated Hazmat Vendor Shipments (DPO IPT, 2004)

| Shipment # | GPC | Aerial Port | ATCMD | MSL | Bar codes | Mark For |
|---|-----|-------------|---------------|---------------|---------------|---------------|
| 1 | No | CHS | No | No | No | No |
| 2 | No | DOV | No | No | No | Yes |
| 3 | No | DOV | Yes | Yes | Yes | Yes |
| 4 | No | DOV | No | No | No | No |
| 5 | No | DOV | No | No | No | Yes |
| 6 | No | DOV | Yes | No | No | Yes |
| 7 | No | DOV | No | No | No | No |
| 8 | No | DOV | No | No | No | No |
| 9 | Yes | CHS | No | No | No | No |
| 10 | No | CHS | Yes | Yes | Yes | Yes |
| 11 | No | DOV | No | No | No | No |
| 12 | No | SUU | No | No | No | No |
| % Frustrated Due to Discrepancies: | | | 75.00% | 83.33% | 83.33% | 58.33% |

Table 3 data seem to indicate that most of the purchases were accomplished via a contract; while this may be the case in some instances, upon further investigation of the original data, at least one of the 12 samples was incorrectly reported by the data collector as “no” in the GPC column. More importantly, a contract purchase may be made using a GPC and all of the GPC holders that were contacted for this research were deployed in expeditionary contracting squadrons. So aside from the accuracy of the data in the GPC column of table 3, the need to differentiate between GPC or contract purchase is also questionable.

The top discrepancy causing the hazmat vendor cargo to become frustrated was the shipment was missing a MSL (bar codes is part of the MSL), with 10 of the 12 shipments lacking that label. What may not be as evident in the data collected in this research but shown in table 3 is that many shipments have more than one discrepancy that is causing frustration; over 58% of the shipments would still be frustrated even if one of the discrepancies was immediately corrected or had never occurred in the first place.

In addition to the DPO IPT data, this research was able to collect archival data from Dover AFB, from two databases. The first was collected over a year period and now is no longer collected; the second is an active data collection with the particular goal of aggregating discrepancy causes and consignors (vendors) to identify trends. This active collection effort is still in its infancy and changes and improvements are ongoing. Various items of collection have changed just in the past three months. These changes have affected the ability for the data to be useful in this research. After close inspection of the data from May 2004, it was deemed unusable because the collection parameters were set to capture shipments frustrated and released within the same month—this excludes shipments that remain frustrated over the change in months from April to May and from May to June. Additionally, as of July 2004, the data collectors at Dover’s aerial port were no longer collecting information pertaining to the length of time the shipment remained frustrated. Tables 4, 5, and 6 show, by collection period, the causes of all frustrations and average number of days the shipments remained in a frustrated state (if available).

Table 4. Frustrated Vendor Hazmat Shipments

| Frustrated Vendor Hazmat Shipments April 2003 - April 2004 | | | |
|---|--------------------|-------------------|------------------------------|
| Cause | # Shipments | % of Total | Ave # Days Frustrated |
| No Shipping Papers/Declarations | 79 | 73.15% | 11.08 |
| No TCN | 11 | 10.19% | 4.1 |
| Misc (MSDS, Info, PSN, Markings, etc.) | 11 | 10.19% | 11.64 |
| No DODAC | 7 | 6.48% | 0 |
| Total Frustrated Hazmat Shipments: | 108 | 100.00% | 9.73 |
| % of Hazmat Frustrated 3 Days or Less: | | | 44.76% |

Table 5. Frustrated Vendor Hazmat Shipments

| Frustrated Vendor Hazmat Shipments June 2004 | | | |
|---|--------------------|-------------------|------------------------------|
| Cause | # Shipments | % of Total | Ave # Days Frustrated |
| No Shipping Papers/Declarations | 20 | 45.45% | 14.55 |
| Misc (MSDS, Info, PSN, Markings, etc.) | 10 | 22.73% | 8.5 |
| Incorrect Certification | 6 | 13.64% | 6 |
| No TCN | 3 | 6.82% | 7 |
| No 1502 Re-Icing, Frozen/Chilled | 3 | 6.82% | 2 |
| Wrong N.E.W. (Net Explosive Weight) | 2 | 4.55% | 10.5 |
| Total Frustrated Hazmat Shipments: | 44 | 100.00% | 10.86 |
| % of Hazmat Frustrated 3 Days or Less: | | | 36.36% |

Table 6. Frustrated Vendor Hazmat Shipments

| Frustrated Vendor Hazmat Shipments 1-17 July 2004 | | | |
|--|--------------------|-------------------|------------------------------|
| Cause | # Shipments | % of Total | Ave # Days Frustrated |
| Misc (MSDS, Info, PSN, Markings, etc.) | 10 | 35.71% | unavailable |
| No Shipping Papers/Declarations | 9 | 32.14% | unavailable |
| Incorrect Certification | 3 | 10.71% | unavailable |
| Packaging Incorrect or Damaged | 5 | 17.86% | unavailable |
| Wrong N.E.W. (Net Explosive Weight) | 1 | 3.57% | unavailable |
| Total Frustrated Hazmat Shipments: | 28 | 100.00% | unavailable |
| % of Hazmat Frustrated 3 Days or Less: | | | unavailable |

The shipper's declaration for hazardous goods is a certification accomplished by an appropriately trained person (AFMAN 24-204, 2001). During the interviews at Dover AFB, it was noted that some vendors may assume that the shipper's declaration is accomplished by aerial port personnel. This requirement is the shipper's responsibility and at the shipper's expense (AFMAN 24-204, 2001). Vendors that engage in transactions with service members and subsequently transport purchased items must be made aware of all requirements. Some vendors may never utilize air transportation for their product, let alone experience international travel restrictions for hazmat.

However, many basic regulatory requirements may still be being overlooked by vendors or carriers of hazmat. During the researcher's interviews at Dover AFB, a

hazmat vendor shipment arrived by truck at the base without required truck markings or shipping papers. The driver of the truck was never informed of the hazardous material that he was carrying. This is just one result that lack of communication or poor training can lead to.

Aerial port personnel interviewed highlighted the following reasons for most hazmat cargo becoming frustrated:

- Packaging
- Adhering to IATA regulations versus military modal transportation manuals/regulations
- MSL is missing
- Declarations of dangerous goods/certification

One interviewee cited an example where packages arrived at Dover without further addressing and wound up on the stock shelves at base supply; adding anywhere from a day to a month to the overall transportation time of the shipment.

Two GPC holders responded that they had had no hazmat vendor shipments frustrated since Jan 04. One responded that they had experienced a frustrated shipment due to lack of documentation, in their case a power of attorney was necessary; this would fall into the miscellaneous category for frustration reasons. Additional probing and follow-up on frustrated shipments may prove that some purchasers are not aware that their shipments are becoming frustrated, if the frustration is not an unreasonable amount of time or the shipment is not a high priority item. The entire dialog and actions taken to correct a shipment may not include the purchaser.

Investigative Question Two

How many shipments were frustrated and how long were these shipments delayed at the aerial ports?

Tables 3, 4, and 5 yield the top causes of shipment frustration for the individual periods collected and percentage of shipments that were frustrated three days or less. This threshold was chosen by the researcher as a reasonable amount of time to correct most discrepancies. For example, some discrepancies (shippers declarations or a MSL) can be corrected by vendors using expedited shipping to forward corrected paperwork to aerial ports. Three days allows for one day to note the discrepancy and contact the vendor, one day to ship the corrected paperwork, and the final day to clear the discrepancy and unfrustrate the cargo.

The number of frustrated shipments that were hazardous material in nature and the average days spent in a frustrated date until discrepancies were corrected and the shipment was released is shown in table 7 below.

Table 7. Frustrated Vendor Hazmat Shipments

| Frustrated Vendor Shipments | | | |
|------------------------------------|--|-----------------------------|---------------------------|
| Time Period | % of Vendor Shipments with Hazmat | Ave. Days Frustrated | % More than 3 Days |
| April 2003 - April 2004 | 28.5% (108 of 379) | 9.73 | 55.24% |
| June 2004 | 53.01% (44 of 83) | 10.86 | 63.64% |
| 1 - 17 July 2004 | 37.84% (28 of 74) | unavailable | unavailable |

The above numbers indicate that hazmat cargo is becoming frustrated and for a significant amount of time. Many shipments are frustrated for less than a day, but the above numbers may indicate that shipments are being frustrated for an increasing longer

amount of time. Further data needs to be collected and compared to confidently identify any trends.

Table 8 below, shows those discrepancies that are associated with the longest frustration delays. The leading discrepancy is also leading the list for longest time in a frustrated state.

Table 8. Discrepancies and Days Frustrated

| Time Frustrated | |
|---------------------------------|--------|
| Cause | # days |
| No Shipping Papers/Declarations | 11.78 |
| Wrong N.E.W. | 10.5 |
| Miscellaneous | 10.14 |
| No TCN | 4.72 |
| No 1502 | 2.00 |
| No DODAC | 0.00 |

Higher headquarters has not mandated collection requirements or metrics and the Customer Service Branch, at Dover, has taken the initiative by establishing their own in-house collection methods to identify vendors with the most discrepancies. Upon close inspection of their May and June data some errors were found and corrected but May's data could not be used in the form provided and the database was subsequently unrecoverable. Additionally, as of Jul 04, Dover is no longer collecting "release date" information, which would reveal the length of time shipments were frustrated and could be correlated to the discrepancy causing the frustration to further direct correction efforts towards the most troublesome types of shipments such as hazmat.

Investigative Question Three

Does the GPC cardholder training adequately cover the purchase and transportation restrictions of hazmat?

Although only two interviews were obtained from deployed GPC holders both answered “no” to this question. In fact, one of the interviewees expanded by saying they didn’t remember discussing this issue and that the shipper (vendor) should be aware of any hazmat or special shipping requirements and should identify them to the purchaser. Unfortunately, the vendor may not be notifying or discussing these restrictions with the purchaser. In fact, the vendor may not be aware of the requirements themselves, and in some cases is not complying with them, as evident by the frustration rates shown in the tables above, this research did not contact any vendors to ask follow-up questions about frustrated cargo. More interviews with GPC holders is required to fully comprehend the adequacy of GPC training received. Also, follow-up interviews with vendors and GPC holders after a transaction is made may be useful to determine what type of information exchange is taking place in order to design an information system tool to meet the needs of the parties involved.

Of interest may be that when the GPC holders were asked how they determine if a purchase contains hazardous material, they indicated: they rely on the contractor or vendor to notify the purchaser or they simply use common sense. Because vendors may not always be aware of the countries or modes of transportation their shipment will be transiting and the associated restrictions, the transportation officer’s role in the GPC transaction would provide needed expertise. Additionally, common sense is not a

foolproof procedure. In today's world, transportation restrictions are constantly changing and inclusion of a transportation expert would prove useful to identify hazmat and associated transportation requirements.

Investigative Question Four

What improvements in written guidance or training can be implemented to reduce or eliminate frustrated vendor shipments?

The aerial port personnel interviewed are not as knowledgeable about GPC training, but they often see the results of the training in terms of fielding questions from cardholders and seeing the discrepancies causing the frustrated cargo. They offered the following suggestions during their interviews when asked about improvements to GPC training:

- Provide cardholders information on dealing with vendors, such as what questions they should be asking regarding transportation and documentation for their purchase
- Establish continuity procedures and personnel overlaps to counter the frequent overseas rotations of contracting officers/GPC (knowledge management)
- Establish closer scrutiny of transportation requirements of the shipper when writing contracts with vendors

Additionally, GPC holders who were interviewed expressed the need for more training overall and specifically more discussion on determining the requirements for the various modes of transportation to be utilized and dealing with foreign customs issues.

Investigative Question Five

What additional measures can be (need to be) implemented to improve the communication and understanding of transportation requirements between GPC cardholders and vendors to facilitate moving a hazmat purchase to the end customer?

All three aerial port persons interviewed relayed positive comments regarding third party firms that play a role in ensuring that all shipments are prepared properly for shipment prior to entering a port; citing instances where this type of process is in place and working at places such as Norfolk's sea port.

Additional areas for improvement cited by the aerial port interviewees include:

- More education for vendors
- More emphasis on vendors having the correct equipment to produce MSN and bar codes
- Discontinue doing business with some vendors who repeatedly send cargo that is not properly prepared
- More emphasis on contract requirements, develop metrics to track frustrated vendor hazmat shipments and corrective actions
- Attention to proper use of TAC, especially during approaching fiscal year changeover
- Improved relationship between contractors and transportation officers
- Restrictions on vendors contracting third parties to fill orders

During the GPC holders' interviews they reinforced the need for more training overall and that the training needs to include foreign customs procedures.

Summary

This chapter analyzed the archival data collected, relevant literature reviewed, and interviews from aerial port and GPC holders and presented findings for each investigative question. These results highlight the need for three parties to communicate (purchaser, transportation officer, and vendor) using an information system, and provide interesting details from which the conclusions are drawn.

V. Conclusions and Recommendations

Chapter Overview

This chapter summarizes the research and analysis. It answers the relevant research question and makes recommendations for action. Finally suggestions for further research efforts are offered.

Research Summary

This research set out to answer the following question: what is the extent that GPC purchases of hazardous material shipments are becoming frustrated upon entering the organic airlift transportation system and does the established guidance sufficiently address these types of purchases? Five investigative questions followed to fully address the different factors of this issue. The first two investigative questions quantified the extent that GPC purchased hazmat cargo is becoming frustrated within the defense airlift system. Through analysis of archival data from a previous study, data collected from Dover AFB's aerial port, and interviews of port personnel these investigative questions and the first portion of the overall research question were answered.

The last three investigative questions address the last portion of the research question: does the established guidance sufficiently address these types of purchases? This portion of the research was answered through the literature review and interviews. The lack of additional interviewees and the possibility that GPC purchasers are not always aware that their purchase was frustrated at some point in the DTS limits the input into investigative questions four and five.

Findings

This research identified areas for significant change in the GPC purchase process: updating/changing written GPC guidance to include a transportation person and use of an information technology tool. By mandating a web-based tool that includes the transportation officer in a GPC (or contract) purchase steps/procedures can be required prior to the final execution (and payment) between a purchaser and vendor.

The Air Force Logistics Support Office's Virtual Vendor Help Desk being developed already includes these three parties, but currently it is not decided if use of this tool will be required (AFMC/LSO, 2004). The site is not yet fully operational but expected to be in August 2004 (USTRANSCOM, 2004).

The areas identified in chapter four as needing additional training, or future items and changes, can be incorporated into web-based tool ensuring all parties are provided the most up to date purchase and transportation requirements. Web-based tools already being tested or partially functional, but not required, have the capability to produce MSL, assign TCN, and ATCMD; additionally when using the Virtual Vendor and requesting the ATCMD the user can identify that the shipment is hazardous and additional web-based information is required (AFMC, 2004). Since the site is not fully functional and some of the required operations are dependant on inputs from purchasers, it is unclear if this website will encompass all the necessary transportation requirements of moving vendor hazmat but it does provide an opportunity to eliminate future frustrated shipments.

GPC Guidance

The literature review of DoD government purchase card guidance revealed a lack of concise steps and direction for its card holders to follow. In particular, GPC guidance and on-line training makes little or no mention of transportation requirements. With the added criticality and potential complexity of shipments entering the DTS to deployed personnel, specific attention should be given to address the added requirements when faced with this situation. In a sense, the guidance can be enhance and simplified by addressing this shortfall and including the transportation officer as a required partner in the GPC transaction. Current studies and collaborative teams led by the DPO are making strides in identifying shortcomings and facilitating the spread of interim corrective measures. The IPT has recently released and posted a “Frustrated Freight Guide” which provides additional instructions that address vendor cargo entering the DTS (PMO, 2004).

Three Roles

Three roles, or functions of three of individuals, need to be connected through DoD guidance: the transportation officer, purchaser, and vendor. Each of these three roles is vital to the successful acquisition and delivery of a hazmat vendor purchase. The current lack of explicit inclusion of the transportation officer does not guarantee failure, but guidance is lacking and inclusion of the transportation officer will have huge benefits.

An additional finding was the plethora of available information from a variety of sources covering the use of the GPC. It was unclear at times which items were directive in nature and which “guides” were either helpful hints or nuggets of knowledge, but not

directive. A close look at re-engineering the GPC program guidance from the service level to the unit level may be warranted. Each military service (and in cases contractors or federal agencies) may have their materials enter the DTS and therefore, common procedures and guidance should be expected. This research cannot, with any authority, state there are any disconnects between the services guidance; but any changes should be applicable to all agencies/services that use the DTS to move purchased materials to the end user.

Information Technology

Also missing from the GPC transaction is an information technology (IT) collaborative tool. There are currently two partially functional or prototype IT tools that may be able to fill this void. The mandatory use of such a tool would not only facilitate the flow of information to the APOE, sending clearance authority and notifying them of an inbound shipment, but could also provide the purchaser and vendor with the most current requirements and necessary documentation and labels for transport. This may yield the most benefit and act as the medium which brings the three functions together to successfully complete a GPC transaction and allow it to move without friction through the DTS.

Overall Research Conclusions

There are definite and intuitive areas for improvement within the GPC program. The ease and introduction of on-line accessible vendors and the emphasis on utilizing the GPC for purchase methods has increased the need for clear communication of transportation requirements especially, but not exclusively, when vendors are preparing

shipments that enter the defense airlift system. Web-based tools are being developed to include the transportation officer in GPC transactions but policy must also be changed to mandate this inclusion. Any web-based tool must address the main requirements for shipments entering the DTS and should also require compliance before payment via the GPC is issued.

Standardized metrics for tracking frustrated hazmat vendor shipments need to be developed. Once formal tracking of metrics is established and aerial port personnel develop procedures and become proficient at data collection, errors will decrease and trend areas needing attention will surface.

Significance of Research

During a conversation with HQ AFMC Logistics personnel, this researcher learned that deployed personnel are willing to accept that a number of their shipments may become frustrated and may never be received. Some may even plan for this case by purchasing more than they need in anticipation of not receiving all items paid for (IPT, 2004). Therefore, a cost savings can be realized by increasing the success of vendor transactions and the confidence of the purchasers awaiting their shipments. Additionally, there can be a cost savings by reducing the amount of time aerial port personnel spend dealing with vendors and purchasers in correcting frustrated cargo discrepancies.

Clear requirements and guidance that include a three party framework (vendor, purchaser, and transportation officer) would enhance the overall success of each transaction. Both the vendor and the purchaser may not possess the transportation knowledge, to meet the restrictions in today's ever changing global environment. Most

importantly, the end goal and ultimate savings may be realized by getting purchased materials to those who purchased them and thus are depending on their arrival for a variety of reasons. Potential delays or changes of operations due to delayed shipments can be reduced, funds can be saved, and manpower can be directed to other requirements.

Recommendations for Future Research

This research has identified a new and challenging problem with much potential for further analysis. However both an opportunity and challenging aspect of this study was the lack of previous research. The concurrent, and much broader, efforts of the DPO IPT did add value and confidence to the results presented here. The IPT is about to embark on a pilot study, in which vendors have agreed to participate and this pilot study should measure the benefits of incorporating the use of a web-based tool such as Virtual Vendor (VV) or STS; since the mandatory use of such a tool (even though development is almost complete) is still uncertain (IPT, 2004-2). Research that focuses on the impact/benefits/or shortfalls that the VV provides to purchasers and/or vendors could yield a significant impact in the final implementation decision. There may be opportunities to join the DPO IPT in their study or future projects regarding frustrated vendor cargo.

A gap analysis of the GPC training provided and the required knowledge (particularly in a deployed scenario) would provide insight to change current guidance and policy. While the present research approached the training in a literature review fashion, it may prove quite different when viewed from the perspective of a GPC holder

who is actually accomplishing the training. This may capture the implicit knowledge that is, or isn't, passed or provided to card holders in practice.

Another area that deserves attention is research into vendor participation in GPC purchases that enter the DTS. By looking at the frustrated cargo problem from the vendor's point of view, different problem areas may be identified that cause delays such as order or information processing and preparing a shipment for transportation. By focusing on the requirements of the vendor, research may yield additional cost and time savings.

Prior to most other research efforts, military leaders should determine what standards or measures are important to meet. Since Dover's aerial port has developed their own tracking and metrics, additional research should be accomplished to determine what data needs to be tracked, what information we should be concerned with, and what is considered acceptable for the AF.

Summary

This chapter summarized the research accomplished and answered the overall research question. It presented significant changes that should take place and that can serve as the environment to address future problems and present solutions in an efficient manner. Finally, several areas for future and follow-up research were presented.

Appendix A: Aerial Port and GPC Holder Interview Questions

Aerial Port Personnel

1. Are GPC purchases becoming frustrated at aerial ports because they did not meet hazardous material transportation, or packaging, requirements (set forth by DoD, IATA, UN, host nation, DOT, etc) for air transport?
2. What is missing regarding hazmat transportation in GPC card holder training?
3. What are the additional or different actions that must be accomplished when a GPC purchase is/or contains hazardous material (if any)?
4. Do you think these additional actions are covered adequately in GPC policy guidance or training? If not, what needs to be changed?
5. How many hazardous material vendor cargo shipments have become frustrated in the last month? Since Jan 04? List each vendor hazmat occurrence (unit/vendor/discrepancy/days frustrated).
6. What was the root cause of the problem(s) (what caused the discrepancies)? List for each occurrence:
7. How can these discrepancies/root causes be mitigated? List for each occurrence:
8. How were the problem(s) corrected? (In terms of: action taken, manpower required, time, cost) List for each occurrence:
9. What was the impact to your operations to correct the shipment problem (delay of operations waiting on shipment, delay of other tasks while correcting this shipment, was there any ripple effect (effect to other units that you were supporting due to this delayed shipment, etc)?)

10. What is being done, at your level, right now to correct/eliminate frustrated GPC purchased hazardous material?
11. What else needs to be/can be done to change GPC policy, training, etc to reduce hazardous vendor cargo becoming frustrated in the air transportation system?

GPC Holders

1. Are GPC purchases becoming frustrated at aerial ports because they did not meet hazardous material transportation, or packaging, requirements (set forth by DoD, IATA, UN, host nation, DOT, etc) for air transport?
2. Does training as a GPC holder adequately cover the transportation and packaging requirements when purchasing hazardous material?
3. What is missing regarding hazmat transportation in GPC card holder training?
4. How does the GPC purchaser determine that a purchase is a hazardous material?
Are there other ways to determine if a GPC purchase contains hazardous materials?
5. What are the additional or different actions that must be accomplished when a GPC purchase is/or contains hazardous material (if any)? Do you think these additional actions are covered adequately in GPC policy guidance or training? If not, what needs to be changed?
6. How many hazardous material vendor cargo shipments have become frustrated in the last month? Since Jan 04? List for each occurrence:
7. What was the root cause of the problem(s) (what caused the discrepancies)? List for each occurrence:

8. How can these discrepancies/root causes be mitigated? List for each occurrence:
9. How were the problem(s) corrected? (In terms of: action taken, manpower required, time, cost) List for each occurrence:
10. What was the impact to your operations to correct the shipment problem (delay of operations waiting on shipment, delay of other tasks while correcting this shipment, was there any ripple effect (effect to other units that you were supporting due to this delayed shipment, etc)? List for each occurrence:
11. What is being done, at your level, right now to correct/eliminate frustrated GPC purchased hazardous material?
12. What else needs to be/can be done to change GPC policy, training, etc to reduce hazardous vendor cargo becoming frustrated in the air transportation system?

Appendix B: USDATL Business Rules



THE UNDER SECRETARY OF DEFENSE

3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

JUL 23 2003

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS DIRECTORS OF THE DEFENSE AGENCIES DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Acquisition Policy on Facilitating Vendor Shipments in the DoD Organic Distribution System

One of the Department's Future Logistics Enterprise (FLE) goals is to facilitate the flow of materiel to the warfighter outside of the continental United States. One way to achieve this goal is to reduce the number of "frustrated" shipments within the Department of Defense (DoD) organic distribution system. Many vendor contracts require vendors to distribute materiel using door-to-door commercial transportation. However, during certain circumstances such as crisis situations and contingency operations, door-to-door commercial delivery may not be possible. If this occurs, materiel enters the DoD organic distribution system for delivery to the ultimate customer. Such materiel is often insufficiently marked and labeled, and subsequently it becomes "frustrated." "Frustrated" materiel can also occur under contracts and under purchases made with the Government Purchase Card (GPC). "Frustrated" materiel from vendors and GPC purchases has hindered consolidation and containerization point and aerial port operations in all recent contingency operations.

To reduce the amount of "frustrated" materiel, all shipments that enter the Department's organic distribution system shall comply with the attached business rules. The DoD organic distribution system includes: the organic Defense transportation system managed by the United States Transportation Command; military department-operated ocean and aerial ports and facilities; defense consolidation and containerization facilities; and defense distribution centers.

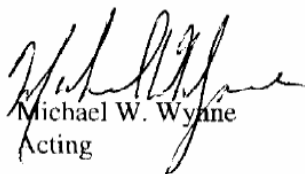
When it is known prior to award that shipments under the contract will enter the DoD organic distribution system, the contract and/or delivery order shall require the contractor to comply with the attached business rules. All solicitations issued after the date of this policy that will require that deliveries be made using door-to-door commercial transportation shall include a provision that requires vendors to notify the contracting officer or the contracting officer's designee when they are unable to use door-to-door commercial transportation and to request alternate shipping instructions. The contracting officer or contracting officer's designee shall expeditiously provide alternate



shipping instructions and make the appropriate contract price adjustments. Contracting officers shall take this same action if they become informed from someone other than the vendor that the vendor will be unable to complete deliveries using door-to-door commercial transportation. For existing contracts and delivery orders, military departments and defense agencies have the discretion, based on the Government's best interest and warfighter needs, to determine whether it is appropriate to modify existing vendor contracts consistent with this policy.

For purchases made with the GPC, when it is determined that door-to-door commercial transportation is not possible, cardholders shall provide vendors proper shipping instructions that will enable the shipment to enter the DoD organic distribution system. The cardholder's requiring activity will advise the cardholder responsible for making the purchase that the "ship to" point for the item is in an area in which commercial deliveries will not be possible. The requiring activity also will provide the cardholder with alternate shipping instructions conforming to the business rules (numbers 1 - 5) attached. Military departments and defense agencies must ensure that acquisition training for Government Purchase Cardholders includes the importance of providing shipping information and transportation considerations to vendors when items are to be shipped using the DoD organic distribution system rather than the preferred door-to-door commercial method of delivery.

This policy will be incorporated into the appropriate acquisition regulations and / or guidelines. Point of contact is Ms. Lisa Roberts, (703) 601-4461, extension 105.



Michael W. Wynne
Acting

Attachment:
As stated

cc:
Chairman of the Joint Chiefs of Staff
Under Secretaries of Defense
Assistant Secretaries of Defense
General Counsel of the Department of Defense
Inspector General of the Department of Defense
Deputy Commander, United States Transportation Command
Deputy Commissioner, General Services Administration Federal Supply Service
Department of Veterans Affairs Office of Management

Acquisition Policy on
Facilitating Vendor Shipments in the DoD Organic Distribution System
Business Rules

For vendor shipments entering the DoD organic distribution system, which includes organic transportation provided by the United States Transportation Command; military department-operated ocean and aerial ports and facilities; defense consolidation and containerization facilities; and Defense distribution centers, vendors must:

1. Adhere to military standard documentation and marking in accordance with MIL-STD-129, *Department of Defense Standard Practice Military Marking for Shipment and Storage*, to include but not limited to Military Shipping Label and bar-coding requirements. MIL-STD-129 may be accessed by clicking "quick search" at <http://assist.daps.dla.mil/online>.
2. In addition to the "ship to" address, include a "mark for" in-the-clear delivery address which includes ultimate consignee's name, organization, unit/departmental name, office symbol, building number, room number, street address, city, state, country code designation, and consignee's DoD Activity Address Code (DODAAC). For shipments moving to overseas locations and for mobile deployable units, the in-the-clear address must also include the host country geographic address (if available) and APO/FPO address
3. Include Transportation Control Number (TCN), Transportation Account Code (TAC), transportation priority, piece count (i.e. number of outer boxes), and required delivery date when available
4. Ensure that packages include a packing slip located in plastic pouch on the outside of the package to eliminate need to open boxes for shipment content identification
5. Appropriately package items to arrive safely in good condition at specified destination
6. During contingency operations, ensure that packages include hard copies of Material Safety Data Sheets for all hazardous materiel secured inside the packing slip
7. Appropriately package hazardous materials to comply with applicable modal requirements and arrive safely in good condition at specified destination
8. Provide in-transit visibility at the time the shipment is initiated (this is required whether or not the shipment is known to be entering the DoD organic distribution system). To simplify vendor compliance with this requirement, Military Departments and Defense Agencies are encouraged to implement automated tools such as the Navy's SMART Transportation Solution (STS) or the DLA's Distribution Planning and Management System (DPMS)

Attachment

Acquisition Policy on
Facilitating Vendor Shipments in the DoD Organic Distribution System

Business Rules (Continued)

9. Provide advanced shipping notice to the first point in the DoD organic transportation system. To simplify vendor compliance with this requirement, Military Departments and Defense Agencies are encouraged to implement automated tools such as the Navy's SMART Transportation Solution (STS) or the DLA's Distribution Planning and Management System (DPMS)

Attachment

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