Federal Property Accountability of Live Animals Used for Agency Missions
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# National Executive Board

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Editor’s Column

Ladies and Gentlemen:

It has been a while since the publication of the last NPMA Journal of Property and Asset Management, which I would like to refer to as the JPAM. Since acronyms run rampant in our profession – it sounded like a good idea!

Finding good quality RESEARCH based articles is always a tough challenge. And it is not that our premiere publication – the Property Professional – is not a quality publication. It, without question, is a GREAT publication. The National and Managing and Regional Editors do a great job of compiling a wealth of information related to our profession. But there are times when an author presents something that just does not “fit” within the confines of the Property Professional and needs a different forum. And that is where the JPAM comes into play.

The JPMA attempts to publish more lengthy articles which may be based upon academic research accomplished through college courses, or industry publications focusing on a well-defined subject matter or a topic loved by the author and which they have done exhaustive research.

This issue of the JPAM presents to our profession three wonderful articles. The authors in this edition are:

Steven F. Holland, CPPM, CF
Amber L. Propert, CPPS
Kelly Marchese
Barbara Rosenbaum and
Yvan Caceres

Steve Holland presents a discussion of “Federal Property Accountability of Live Animals Used for Agency Missions” -- an area that most of us give short shrift to – but after a close reading will garner some new found attention.

Amber Propert does a detailed analysis of the Contract Line Item Structure – another topic that we pay little attention to until it is desperately needed to solve some contractual issues related to Government property.

And lastly, three new authors to the NPMA family -- Kelly Marchese, Barbara Rosenbaum and Yvan Caceres provide us some great information regarding Risk Management in the Medical Warehousing environment. A new topic for many of us!

My congratulations to the authors and to the NPMA as the JPAM continues to grow in depth and breadth. BRAVO to all!
Ladies and Gentlemen, you have in front of you the fourth edition of the Journal of Property and Asset Management. I encourage you to read deeply!

Dr. Douglas N. Goetz, CPPM, CF
Editor, The Journal of Property and Asset Management (JPAM)
FEDERAL PROPERTY ACCOUNTABILITY OF LIVE ANIMALS USED FOR AGENCY MISSIONS

Steven F. Holland, CPPM CF
NOVA Chapter
The federal government today is being defined by how they show and provide value to the American taxpayers. Some call it the Age of Austerity. What it may really be is the move toward an era of effectiveness, efficiency, accountability and sustainability. When Federal Property Managers (hereafter referred to as Property Managers) look at their personal property portfolios, they must do so with a keen eye toward the customer—and the customer in this case is the American taxpayer. Being good stewards of taxpayer’s dollars. Regardless, if it is equipment or live animals acquired through federal appropriated funds, it is Government property. It must be accounted for and managed in a portfolio throughout the asset management lifecycle.

This article highlights the federal property accountability of live animals used to support agency missions. It focuses primarily on canines, horses and mules and their importance from the property management lifecycle perspective.

Background

Live animals have been used by the federal government for many years, all the way back to the Civil War. The Union forces, mounted Cavalry, fought in the Civil War on horseback, armed with carbine rifles, pistols and sabers. The forces used horses to move more easily to carry out their mission of fighting the Confederate infantry. The principal item of equipment for a cavalryman was the horse. There were financial considerations by the North and South armies in forming mounted cavalries. The cost for outfitting a cavalry regiment was $300,000 for the initial compliment with annual operating and maintenance expenses exceeding over $100,00. Even early during the war, there were issues open to fraud. The Government had to tighten regulations and enforce inspections. The contract system used then yielded approximately 650,000 horses for the Union armies to fight the war. This is exclusive of the 75,000 horses confiscated by Union soldiers in Confederate territory.

The Federal Property and Administrative Services Act permitted for the creation of the Federal Property Management Regulation (FPMR) and the Federal Management Regulation (FMR) under Title 41 of the Code of Federal Regulations. Other key statutes and guidance related to accountability and auditability that are important to understand include the following:

- Federal Financial Management Improvement Act (FFMIA) of 1996 (Pub. L. 104-208)
- FASAB Statement of Federal Financial Accounting Standard 6
- Office of Management and Budget (OMB) Circular A-123, Management’s Responsibility for Internal Control

1 National Archives. RG 92, James A. Ekin to Montgomery Meigs, January 31, 1866.
During World War II, U.S. Army Canine (K-9) Corps used more than thirty breeds of dogs. However, over time it was narrowed down to five breeds: German Shepherds, Belgian Sheep Dogs, Doberman Pinschers, Farm Collies and Giant Schnauzers.

In modern day, canines are used as military working dogs (MWDs) in a variety of roles: sentry, scout or patrol, messenger, mine, casualty, tunnel, narcotics and explosive detection and specialized mission functions for the Department of Defense and other government agencies. The preferred breeds of dogs used are German and Dutch Shepherds and Belgian Malinois because of their aggressiveness, keen intellect, loyalty and athleticism. Retrievers (Labrador, Golden or Chesapeake) are used as MWDs to detect single odors. German shepherds preferred due to the multiple traits they possess. They are intelligent, dependable, predictable, easily trained, usually moderately aggressive and readily adaptable to nearly any climate. The MWDs are procured and trained by 341st Military Working Dog Training Squadron. The 341st mission is to provide trained military working dogs and handlers to carry out the DoD and other government agencies and allied missions. The 341st Training Squadron’s mission is to be the recognized world leader in procurement, training and distribution of working dogs and handlers; to promote teamwork and continuous improvement through unparalleled veterinary care, sound breeding practices, and innovative training techniques and technologies; to explore new and effective ways to employ working dogs; and to have world-class facilities to support their critical mission and to protect and provide security for our nation and its resources world-wide.

The Department of Homeland Security’ Transportation Security Administration (TSA) and Customs and Border Patrol (CBP) also procure and train working dogs. TSA working dogs are procured through the DoD Military Working Dog Program and and trained at the TSA Canine Training Center at Joint Base San Antonio-Lackland, TX. CBP procures working dogs from their Canine Center El Paso (CCEP) in El Paso, Texas and Canine Center Front Royal (CCFR) in Front Royal, Virginia. Both locations provide customized training to ensure the unique requirements of the Department are met.

**Purpose**

Why it is important to account for live animals? It is extremely important to account for live animals so you know where to find them when they are needed at any given time and they are in top shape to perform the mission with their handler. Handlers depend on their working dog to carry out their mission, whether it be in a domestic airport, seaport, or border crossing or overseas fighting a war in Afghanistan or another country.

Federal regulation, 5 CFR 2635.704 (a), Use of Government Property, stipulates that Government property includes any form of real or personal property in which the Government has ownership, leasehold, or other property interest as well as any right or other intangible interest that is purchased with Government funds, including the services of contractor personnel.
Therefore, Property Managers must have a solid handle on their entire personal property portfolio and maintain a keen understanding of their processes to ensure that agency investments are recorded and managed throughout the asset management life cycle and capitalized assets are recorded in the Agency’s financial management system. It’s not good enough to have a 50 percent or 75 percent understanding of what you have, and how you’re using it, Property Managers must have a complete understanding (100%) of Property, Plant and Equipment (PP&E) so they can best support their agency’s strategic goals and mission. A capitalized asset is defined as a tangible personal property asset that has an estimated useful life of two years or more, and has an acquisition cost at or exceeding the Agency’s personal property capitalized threshold, and it is recorded in the Agency’s financial general ledger and financial management system. Capitalized asset values are depreciated over the course of the asset’s useful life after it the date it is placed in service. On the other hand, personal property assets that are purchased and made ready for their intended use (e.g., full operational capability) and their total acquisition cost (unit acquisition cost, training, freight costs and installation costs) does not exceed the Agency’s capitalization threshold for personal property, then the asset is defined as an expense asset.

Maintaining accountability of Government property is critical to accomplishing the agency’s mission and the agency’s financial bottom line. Government property is identified in the Agency’s Annual Financial Report in the Balance Sheet as PP&E. Accountability for all Government property that is designated as “accountable property.” Accountable property is defined as an asset that meets one or more of the following criteria: (1) expected useful life is two years or more and has an initial acquisition cost exceeding $5,000.00; (2) that are classified as sensitive or pilferable regardless of cost; (3) for which controls and official asset records are maintained in the Agency’s Accountable Property System of Record (APSR); (4) for which physical inventories are conducted; (5) that is otherwise assigned and accounted for.

PP&E is defined as tangible assets, including land that have an estimated useful life² of two (2) years or more; the assets are not intended for sale in the ordinary course of operations; and they have been acquired or constructed with the intention of being used, or being available for use by the agency. It also includes assets acquired through capital leases, including household improvements; property owned by the reporting agency in the hands of others (e.g., state and local governments, colleges, universities, or federal contractors [i.e., GFP/CAP]); and land rights.

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² Useful life is the normal operating life in terms of utility to the owning agency. (adapted from Kohler’s Dictionary for Accountants)
It is essential that Property Managers understand acquisition planning, understanding the costs involved in acquiring assets, identifying and classifying the asset at acquisition, ensuring asset valuation is accurate, recording assets upon vendor delivery in the Accountable Property System of Record (APSR) and getting the most use or utility out of assets is paramount. Once the asset is placed into service, the asset is maintained throughout its useful life and when declared surplus it is disposed in an environmentally-friendly manner.

There are special statutes and regulations governing live animals. Live animals used to perform agency missions must be recorded and maintained in a system of record. Property and financial management records are essential in the sustainability of Government property. As you will see, live animals, such as canines, horses and mules, are a defined asset class within some agencies, and they are designated as Government personal property because they are purchased with appropriated funds from Congress – even though they are live animals. They are assets that perform work and a specific or multiple missions, and bring value to an agency.

Federal leaders must have a complete grasp of Property Management because it does contribute to the bottom line—it helps support mission and adds value! This is where the asset management life cycle comes in. Federal law requires agencies to manage government property entrusted to them by the American taxpayer and all federal employees have a fiduciary responsibility to care for, use, protect and dispose in an environmental friendly and in some cases secure manner. As a result, agencies must have policies and procedures defined to inform the workforce and guide the property management process.

**Property Management Policy**

What keeps a Property Manager or a senior executive responsible for asset management awake at night? Is it the realization that you don’t know what assets you have, where they are, if your records are accurate, if the assets will be needed in an emergency? This is why we invest in and train people to perform property management.

This question and the sleepless nights, can be traced all the way back to 1949, when to the Federal Property and Administrative Services Act was enacted for the purpose of prescribing methods for the procurement and polices of managing personal property assets in the most effective and efficient manner.

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3 Department of Defense, Defense Logistics Agency, Federal Supply Group 88, Live Animals

“*The Federal Government has an overriding obligation to American taxpayers. It should perform its functions efficiently and effectively while ensuring that its actions result in the best value for the taxpayers.*”

President Barack Obama, March 4, 2009
There are laws, regulations, and guidance that provide guidance that affects Government property and the property management process. The Chief Financial Officers Act of 1990 (CFO Act) implemented new legislation that called for improvements to the government’s financial management; and later in the Federal Financial Management Improvement Act (FFMIA) of 1996, new mandates were set to ensure the accuracy and verifiability of financial and property ledger data through an agency’s financial management system. These mandates solidified the need for management and federal agency personnel adherence to established property and financial management principles.

The Federal Property Management Regulation (FPMR) was written with this in mind (see sidebar), but over the years, many of its sections, if not all, have been superseded or incorporated into the Federal Management Regulation (FMR) under Title 41 of the Code of Federal Regulations (CFR). As a result, it is this subsequent document, and not its predecessor that evolved into the Federal Property Managers’ “bible” — the primary reference for managing federal property. Of particular note within the FMR is the separation of “Personal Property” (codified under Title 41, Code of Federal Regulations (CFR), Subchapter B [41 CFR §102]) which addresses personal property requirements from a federal agency perspective. Federal agencies may develop supplemental regulations to address Agency-unique situations.

OMB Circular A-123, *Management’s Responsibility for Internal Control*, requires federal managers to “improve accountability and effectiveness of Federal programs and operations by assessing, correcting, and reporting on internal controls.” This circular gets its authority from the Federal Managers’ Financial Integrity Act of 1982, as codified in Title 31 of United States Code, Section 3512 (31 U.S.C. 3512). Federal managers must establish a program to develop and sustain internal controls to achieve effective and efficient operations, reliable financial reporting, compliance with applicable statutes and regulations, and assurances in its Performance and Accountability Report (PAR), including a separate assurance on internal control over financial reporting (ICOFR).

OMB Circular A-136, *Financial Reporting Requirements*, requires federal agencies to submit audited financial statements, interim financial statements, and performance assessment reports (PARs) to OMB, U.S. Department of the Treasury, and Congress in accordance with statutory requirements including CFO Act and Accountability of Tax Dollars Act (ATDA) of 2002 to support the preparation of the *Financial Report of the United States Government*. This report requires information on PP&E capitalized assets and is listed under Note 6, *Property, plant and equipment, net*. Capitalized assets in a federal agency involve personal property, real property, internal use software.

All accountable federal government property must be accounted for and recorded as required in the agency’s Accountable Property System of Record (APSR) for accountability and financial

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reporting purposes and included in the agency’s financial statements (e.g., Balance Sheet) under “PP&E.”

From a Department of Defense (DoD) perspective, live animals used to perform agency missions are categorized as personal property and fit into Federal Supply 88-20, Live Animals Not Raised for Food.⁵

**Animals as Assets**

An asset is defined as a tangible or intangible item owned by or in the possession of an entity that have probable economic benefits that can be obtained or controlled by the entity. Animals that are acquired by federal agencies through appropriated funds are Government property. As such, all government property that is categorized as accountable property (e.g., personal property) is recorded in the Agency’s Accountable Property System of Record (APSR) and managed throughout the property management lifecycle.

**Property Management Lifecycle**

The property management lifecycle has six phases (illustrated in Figure 1), beginning with *Acquisition* and ending with *Disposal*. At the end of the process, when an asset in usable condition is no longer required for its intended purpose, it is declared excess by the accountable organization and advertised or screened throughout the agency for reutilization, or in some cases canines are donated to the handler⁶. Advertising excess property within an agency or within the federal government can lead to achieving further utility of assets to support the agency’s mission. If there are no claims within the agency for the asset, it is processed for disposal (transfer, sale, exchange/sale, donation, or abandonment and destruction).

*Figure 1. Property Management Life Cycle*

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⁶ 40 U.S.C. 555 and 41 CFR 102-36.365 authorizes federal agencies to donate canines to their handlers when they have reached their useful service life.
Acquisition

Acquisition, the first phase of the property management life cycle, is where agencies obtain property following an identified need and approval of an acquisition plan. Acquisition is “the means of acquiring by contract of supplies or services (including construction) with appropriated funds for the use of the federal government through purchase or lease, whether the supplies or services are already in existence or must be created, developed, demonstrated, and evaluated.” Acquisition begins at the point when agency needs are established and includes the description of requirements to satisfy agency needs, solicitation and selection of sources, award of contracts, contract financing, contract performance, contract administration, and those technical and management functions directly related to the process of fulfilling agency needs by contract.” It formally documents the approach in screening available excess as the first source of supply, filling the need, optimizing resources, and satisfying the policy requirements for the acquisition.

Live animals acquired to perform agency missions are trained for specific capabilities such as a canine for patrol; explosive, drug, or mine detection; apprehension; specialized search; combat tracking; and improvised explosive device detection.

The best breeds for explosive detection according to the Department of Homeland Security’s Transportation Security Administration (TSA) are Belgian Malinois, Labrador Retriever, German Shorthair Pointer and Wire-haired Visla. These dogs are procured from eastern Europe through a Defense Department program.

Receiving

The Receiving phase is the process of accepting property (e.g., working dog) into an agency’s control and accountability; this is where the agency’s obligation and responsibility for asset management and accountability begin. This process starts when the working dog is arrives at the receiving facility, the delivery person must obtain the receiving officer’s signature on behalf of the agency. Receiving documentation is created to establish physical custody and accountability within the Agency. It is valuable because it demonstrates proof of receipt when an agency actually received the property into the agency’s custody. Proof of receipt is also critical for capitalized and donated property because it establishes the receipt date to support the agency’s general ledger entries and annual financial report.

Accounting

The Accounting phase, involves recording and maintaining the property and financial transactions in a business system of record in order to support the agency’s financial statements. According to the CFO Act, each agency’s CFO is responsible for the financial accounting for all PP&E and must ensure compliance with all federal statutes, regulations, and control guidance.

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7 Federal Acquisition Regulation (FAR), Part 2.101, Definition of Acquisition.
related to financial management. CFOs also must sign a Statement of Assurance each fiscal year ensuring the accuracy of the financial records and the document the results of their independent third-party financial statements audit in their end of fiscal year Agency Financial Report to OMB and Congress.

One of the key guidance documents for Asset Managers and Financial Managers is the Federal Accounting Standards Advisory Board’s (FASAB) Statement of Federal Financial Accounting Standard (SFFAS) No. 6, “Accounting for Property, Plant and Equipment.” PP&E is defined as tangible assets that have an estimated useful life of two years or more, are not intended for sale in the ordinary course of agency operations, and have been acquired or constructed with the intention of being used or being available for use by the agency. Property Managers must classify assets before they are acquired and recorded when they are received by the agency. FASAB SFFAS 6, *Accounting for Property, Plant and Equipment*, addresses the accounting of personal property and real property. SFFAS 6 is the primary accounting standard related to the accountability of live animals.

Federal Property, Program, and Financial Managers are responsible for the accountability and valuation of PP&E that is acquired using federal appropriated funds.

**Asset Classification**

Federal assets acquired with appropriated funds are Government property and are designated as personal property. are categorized by an asset classification. In some agencies, live animals are categorized by a federal supply classification and placed into Federal Supply Group 88, Live Animals and Federal Supply Class 8820, Live Animals Not For Food. Furthermore, agencies assign asset classifications to define the category of personal property such as Canines, Horses, and Mules. But for now, I will address canines. Figure 3, identifies DoD’s extensive cataloging system of multiple military working dog (MWD) nomenclatures and Federal Stock Numbers (FSNs):

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**Figure 2. DOD MWD Federal Stock Numbers and Nomenclatures**

<table>
<thead>
<tr>
<th>FSN</th>
<th>NOMENCLATURE</th>
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<tr>
<td>8820-00-043-3526</td>
<td>Explosive Detector Dog (EDD)</td>
</tr>
<tr>
<td>8820-00-188-3880</td>
<td>Patrol/Explosive Detector Dog (P/EDD)</td>
</tr>
<tr>
<td>8820-00-238-8577</td>
<td>Drug Detector Dog (DDD)/Large</td>
</tr>
<tr>
<td>8820-00-243-7542</td>
<td>Patrol/Drug Detector Dog (P/DDD)</td>
</tr>
<tr>
<td>8820-00-435-9005</td>
<td>Patrol Dog (PD)</td>
</tr>
<tr>
<td>8820-00-935-6677</td>
<td>Untrained Dog</td>
</tr>
</tbody>
</table>
Auditability

On a related note to accounting, the auditability of PP&E refers to maintaining policy, business systems, processes, and internal controls designed to support the agency’s financial statements (e.g., Balance Sheet, and Statement of Net Cost). The purpose of auditability is to ensure the financial condition and total value of the agency’s PP&E, including government property in the possession of contractors, is accurately presented in the financial statements. This is where federal agencies need to get it right when accounting for personal property. Agencies need to account for costs related to the acquisition of live animals used to perform their agency mission. Accounting for all relevant and reliable costs to bring the animal to its full operational capability (FOC) to perform the mission that it was intended for (bomb detection, drug detection, apprehension, protective service, etc.).

Figure 3. Acquisition Costs of an Explosive & Drug Detection Canine
(For Illustration Purposes Only)

<table>
<thead>
<tr>
<th>Work-in Progress</th>
<th>FOC</th>
<th>Asset Cost (Personal Property)</th>
<th>Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4,600</td>
<td>$45,400</td>
<td>$51,000</td>
<td>$51,000</td>
</tr>
</tbody>
</table>

So let’s take an exploratory journey here for a second, A U.S. Federal Agency purchases a Belgian Malinois canine from an approved source of supply to support a mission that involves explosive and drug detection. The unit acquisition cost of the canine, plus the cost of any specialized training to bring the canine to its full operational capability (FOC), and any freight costs or installation costs, all asset costs are additive, becomes the total acquisition cost of the Explosive and Drug Detection Canine ($52,000.00). This cost is recorded in the Agency’s Accountable System of Record. If the total acquisition cost exceeds the Agency’s capitalization threshold for personal property, and let’s say just it is $50,000.00, then it is a capitalized asset. The agency must record the date the capitalize asset is placed-in-service, because that is the date the financial depreciation starts for that capitalized asset. On the other hand, if the Agency’s capitalization threshold for personal property is let’s say $250,000.00, then the $52,000 Explosive & Drug Detection Canine is classified as an “expense asset.” It is expensed in the period it was acquired.
Asset Valuation

Asset valuation is important for both accounting and accountability reasons. Accounting for capitalized assets really depends on accurate valuation information. What is the total acquisition cost of the asset and is it documented with supporting documentation such as a supplier’s invoice, DD1149 Requisition and Invoice/Shipping Document or a similar form, a DD1354, Transfer and Acceptance of DoD Real Property or an estimate based on an approved agency valuation methodology? Property Managers know that all government property must have supporting documentation to support the valuation, identification, receipt date on the property record. When this information is not available during an internal Inspector General (IG) or third-party audit, it may be identified as an audit finding and the circumstances surrounding it a material weakness. A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the entity’s financial statements will not be prevented, or detected and corrected, on a timely basis. A deficiency in an agency’s internal controls exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis.

Once assets are recorded in the Agency’s APSR and the valuation is accurate, placed-in-service dates are noted, the asset transitions into the fourth phase, utilization.

Utilization

The fourth phase, Utilization, is a series of activities that involves placing an asset into use and tracking the asset’s usage throughout its useful life. Another form of Asset Manager within a federal agency is the National Utilization Officer (NUO). NUOs are responsible for maintaining an effective utilization program. Two key aspects of an effective utilization program include maximizing the usage of an asset throughout its useful life and making assets available for reutilization when they become idle or excess within an agency. Asset Managers that demonstrate effective utilization are performing their stewardship responsibility for the property under their agency’s accountability and control. NUOs must remain in the forefront of utilization issues both from an operational and financial perspective. They need to identify valuable asset performance improvements and report them within their agency to promote business efficiencies and contributions to the agency’s goals and objectives.

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Animals used to perform agency missions can get into harm’s way. Canines are used by the U.S. Marine Corps Special Forces in military missions abroad. An article titled “A Marine’s Best Friend” describes a smart German Shepard-Belgian Malinois mix, Lucca K458, that became a decorated war hero after acting as the first line of defense in sniffing out improved explosive devices (IEDs) in Afghanistan. Lucca led Special Forces soldiers onto a battlefield in Afghanistan’s Helmand River valley in March of 2012. She fought alongside her handlers through two wars in Afghanistan and Iraq and lost her left front leg in an IED explosion. Lucca now wears an honorary Purple Heart and is the subject of a book “Top Dog: The Story of Marine Hero Lucca.”

**Animal Welfare Act**

Many agencies have policies and procedures that provide direction and guidance for the care and use of animals in accordance with the Animal Welfare Act of 1966. The Federal Law Enforcement Animal Protection Act of 2000 protects federal animals from anyone whoever willfully and maliciously harm any law enforcement animal or attempts to conspire to do harm may be imprisoned for not more than 10 years. If any animal is permanently disabled or disfigured, caused seriously bodily injury or death of the animal may be imprisoned for 10 years.

Reutilization is the identification of idle or excess assets that can be advertised throughout an agency against known requirements in order to keep the asset in use. NUOs are responsible for maximizing the ROI of their agency’s asset portfolio. Reutilization of assets reduces or eliminates unnecessary new procurements of like assets and reduces costs for storage, security, and physical inventory. Reutilization of assets is the best use of the taxpayer dollars, especially in agencies with tight or limited budgets. It enables agencies to get “more bang for the buck,” and it demonstrates good stewardship.

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11 Pub. L. 106-254, Sec. 2. § 1368, Harming animals used in law enforcement
Maintenance

The fifth phase, maintenance, is the act of maintaining assets in proper working condition or preserving it from failure or decline. Assets must be maintained throughout their useful life in order to ensure that the product or service can be provided on time and as required. Property Managers that maintain effective programs to monitor maintenance can help their agency identify the cost and frequency of repairs compared with the cost to replace or refurbish an asset or its criticality and availability. Canines must receive veterinary checkups periodically and records must be maintained to document such check-ups. Property records are the nucleus of the property management system.

Disposal

The sixth and final phase, Disposal, is the process where assets are disposed of through transfer, exchange, sale, recycle, donation, and abandonment or destruction methods, and the assets are removed from the agency’s official property records. The property disposal process is regulated by multiple parts of the CFR under Title 41, Chapter 102. The General Services Administration (GSA) prescribes policy related to the disposal of excess personal property under 41 CFR § 102-36, Disposition of Excess Personal Property. This policy promotes the maximum use of excess government personal property by U.S. executive agencies. When working dogs reach the end of their service life, federal statute and regulation allows agencies to donate MWDs (i.e., canines) to their handlers under 40 U.S.C. 555 and 41 CFR 102-36.365.

Property Managers need to know what authorities are afforded to agencies relative to all asset classes within personal property. It is important to know that canines that reach their end of service life can be donated directly to the handler. This means there is a transfer of accountability from the Agency to the federal employee. The asset is removed from the property records based on the official property transfer document noting the donation.

If you have a unique circumstance, contact your local General Services Administration (GSA) Area Property Officer (APO) for assistance with the disposal process of your excess accountable personal property assets.

Conclusion

Live animals purchased with U.S. Government funds are U.S. Government property. They are personal property assets, because live horses, mules and canines used to perform Agency missions provide benefit and value to the Agency. Agency senior executives, program managers and property managers must have a complete understanding of PP&E. These assets must be accounted for and recorded in an Accountable Property System of Record (APSR) regardless of cost. Live animals whose total acquisition cost that exceeds the agency’s capitalization threshold for personal property are designated as capitalized assets and must be recorded in both the APSR and the Agency’s Financial Management System and depreciated based on the date placed in service. Live animals that do not exceed the agency’s capitalization threshold are designated as
expense assets, and accountability still must be maintained. All live animals must be managed throughout the property management lifecycle until they reach the end of their service life. In the case of canines, they can be donated to their handler under the authority of 40 U.S.C. 555. Other animals can be transferred to another federal agency that has a requirement to use the animal. Otherwise, animals are reported to the General Services Administration, Area Property Officer to assist in the disposal process. Some animals have been donated to State Agencies for Surplus Property (SASP) so the animals can be donated to zoos, owners that have the capability to care for the animals in the most humane way until the natural end of their life. As Property Managers, we must be good stewards of taxpayer’s dollars and ensure we establish and maintain accountability of live animals used to perform agency missions throughout the property management lifecycle.

**Biography**

Steven Holland is a Senior Consultant with LMI in McLean, Virginia. He has over 30 years of experience in asset and logistics management as a contractor and consultant to the federal government. Mr. Holland has supported several federal logistics and asset management projects for the Department of Homeland Security, the Environmental Protection Agency, and several organizations within the Intelligence Community. His subject matter expertise and implementation of industry leading best practices have led to results that endure. Mr. Holland’s education includes a Bachelors of Business Administration with concentration in Acquisition and Contract Management with honors from Strayer University. He currently holds NPMA CPPM certification and was awarded NPMA’s Consulting Fellow recognition in 2013. Mr. Holland has been a member of NPMA since 1988 and is a current member of the NOVA Chapter.
Authorities & References

Public Laws

Pub. L. 106-446, 114 Stat. 1932, Promotion of adoption of military working dogs
Pub. L. 107-289, Accountability of Tax Dollars Act (ATDA) of 2002
Pub. L. 112-81, § 351 (2), Subsec. (c), Adoption of military working dogs
Pub. L. 112-81, § 1061 (20), Subsecs. (f) and (g), Annual report of military animals adopted and euthanized

United States Code

10 U.S.C. § 2583, Military animals: transfer and adoption
18 U.S. Code § 1368, Harming animals used in law enforcement
31 U.S.C. § 3512, Executive agency accounting and other financial management reports and plans
40 U.S.C. § 102, Definitions
40 U.S.C. § 555, Donation of law enforcement canines to handlers

Code of Federal Regulations

5 CFR 2635.704 (b)(1), Government property
9 CFR 3, Standards for the Humane Handling, Care, Treatment, and Transportation of Live Animals (by category)
41 CFR 102-36.365, Transfer or donate canines that have been used in the performance of law enforcement duties
49 CFR 80502, Transportation of animals

Federal Guidance

OMB Circular A-123, Management’s Responsibility for Internal Control
OMB Circular A-136, Financial Reporting Requirements
SFFAS 6 – Statement of Federal Financial Accounting Standards 6: Accounting for Property, Plant and Equipment

Agency References


Articles

http://www.uswardogs.org/war-dog-history/types-war-dogs/
http://parade.com/342211/parade/a-marines-best-friend/
http://en.wikipedia.org/wiki/working_animal

Definitions:

**Asset:** A tangible or intangible item owned by or in the possession of an entity that have probable economic benefits that can be obtained or controlled by the entity. See term Personal Property.

**Personal Property:** Any property, except real property. This term excludes records of the federal government and naval vessels of the following categories: battleships, cruisers, aircraft carriers, destroyers and submarines (see term: Asset).

**Asset** – Something valuable that an entity owns, benefits from, or has use of, in generating income. Something that an entity has acquired or purchased, and that has money value (its acquirement cost, book value, market value, or residual value). (Source: http://www.businessdictionary.com/definition/asset.html)

**Military animals** - Domesticated animals that are used in warfare and other combat related activities. As working animals, military animals serve a variety of functions. Dogs, pigs, oxen, camels, horses and other animals are sometimes used for transportation and bomb detection. Elephants, pigeons and rats are also used during wartime, while dolphins, and sea lions are in active use. (Source: https://en.wikipedia.org/wiki/Military_animal)

**Property** — The term “property” means any interest in property except—

(A)(i) the public domain;
(ii) land reserved or dedicated for national forest or national park purposes;
(iii) minerals in land or portions of land withdrawn or reserved from the public domain which the Secretary of the Interior determines are suitable for disposition under the public land mining and mineral leasing laws; and
(iv) land withdrawn or reserved from the public domain except land or portions of land so withdrawn or reserved which the Secretary, with the concurrence of the Administrator, determines are not suitable for return to the public domain for disposition under the general public land laws because the lands are substantially changed in character by improvements or otherwise;

(B) naval vessels that are battleships, cruisers, aircraft carriers, destroyers, or submarines; and

(C) records of the Government.

(Source: 40 U.S.C. 102)

**Personal property** - means any property, except real property. For purposes of this part, the term excludes records of the federal government, and naval vessels of the following categories: battleships, cruisers, aircraft carriers, destroyers, and submarines.

(Source: 41 CFR §102-36.40)
Analysis of Contract Line Item Structure and the Effect on Property Accountability

Amber L. Propert, CPPS
Federal Center Chapter

I. Situation Analysis

The Department of Defense (DoD) holds approximately $435 billion in capital equipment assets which must have an auditable trail and demonstrate full property accountability. All new capital assets are obtained by a contract or a series of multiple contracts. The nature and complexity of these assets can be traced to the procuring documents which in turn set the stage for the data required to maintain accountability and be evaluated for audit purposes.

The DoD must follow numerous regulations and policies to ensure appropriate fiscal responsibility. The Chief Financial Officers’ Act of 1990 (CFO Act) dictates the need for the Federal Government, which includes DoD, to have sufficient business processes to ensure expenditures are auditable. The Federal Acquisition Regulation (FAR) along with the Defense Federal Acquisition Regulation Supplement (DFARS) dictate how DoD may purchase goods and services. The Federal Management Regulation lays the foundation for how Government owned property must be managed. These regulatory works are in turn incorporated into DoD level policy and procedures.

DoD is the only major federal agency that cannot comply with the law to produce financial statements for independent audit. The National Defense Authorization Act for Fiscal Year 2010 requires the DoD to be auditable in fiscal year 2017. Many efforts to streamline, enhance, and generally comply with the aforementioned regulations and DoD specific policies have ensued. The work remaining to be done requires the Acquisition and Logistics community to lead the effort by supporting the Financial community.

Existence and Completeness (E&C) is the portion of the audit process that focuses on property. In order to achieve a clean audit opinion, the DoD must ensure the property records maintained are complete and all existing property has a corresponding property record. The completeness of the record extends into having supporting documentation such as contracts, purchase requests, delivery documents (DD Form 250), custody documents (e.g. DD Form 1149, DD Form 1348-1A), etc. The contract is especially important as it shows what was purchased, when, what it cost, and even holds authorization for a contractor to utilize Government owned property.

The Defense Procurement and Acquisition Policy (DPAP) office, which is a governance office for the DoD, has performed a clause inclusion analysis specifically limited to the FAR Government Property clause (FAR 52.245-1) and five mandatory clause supplements from the DFARS. The analysis focused on contracts issued by quarter, with the most recent quarter studied being second quarter of fiscal year 2014. The Department wide compliance rate for all
reported contracts has remained around 25% for complete inclusion of all mandatory clauses. Additionally, the DPAP office has examined the contract line item structure for unit of measure integrity. The unit of measure examined most closely is “lot” when applied to deliverable end items. Several thousand contracts were identified that used “lot” as a unit of measure, though the end item should clearly have been identified as “each” – a short hand way of skipping doing simple mathematics in the contract structure.

The combination of mathematically oversimplifying the contract line items with missing Government property clauses has a direct impact on appropriate property accountability. This leads to a problem where accounting treatments cannot be correctly applied, nor can correct payment be made for those assets delivered under an incorrect “lot” assignment. Major Defense Acquisition Programs (MDAPs) are subject to accounting treatments in the contract structure as demonstrated in the Proper Financial Accounting Treatment for Military Equipment (PFAT4ME) guidance, which calls for a particular line item structure to be used in the contracts. The PFAT4ME guidance (DoD Instruction 5000.02) was structured to address the requirements of the CFO Act.

II. Premise

Premise

Improperly detailed and noncompliant contracts for major defense procurements cause excessive administrative burden for audit and accountability purposes. Correctly writing contracts with mandatory clauses and appropriate levels of detail decreases the workload for contract administration, financial accounting, and property accountability and management.

Definitions

“Excessive” means creating property administration corrective actions, improper payment actions, or other corrective actions as a result of a poorly written contract.

“Improperly detailed” means contracts that summarize to the highest level the purchases that are being made.

“Noncompliant” means contracts that have omitted one or more mandatory clauses specifically dealing with Government property concerns.

III. Disclaimers or Study Limitations

Due to the size of the Department of Defense (DoD) and the amount of business conducted in any given time period, the following limitations are imposed upon the data selected to ensure a concise picture is obtained:

- Accountability over equipment “in theater” will not be addressed. Equipment “in theater” means an active war zone. This includes contracts issued outside of the continental United States, regardless of status of international relations.
- Government furnished property (GFP), which includes equipment, will be limited in examinations to the impact of GFP on the acquisition cost of the deliverable item.
- The study will focus on the Army and Air Force and selected contracts of each. Both services are in the middle of preparing for audit and will be in a position to assist in answering audit-type questions.
- Research and Development contracts will not be examined.
iv. work plan: applied research methodology

1) statement of purpose – to determine the impact, if any, of contract structure on property for audit readiness and property accountability.

2) proposed questionnaires – the questionnaires will vary depending on the job description of the person that is being questioned. we will be talking to the acquisition, logistics, and financial communities within the army and air force. below are the questions:

acquisition/contracting
what guidance do you follow to apply the unit of measure within the clin structure?
who is responsible for applying pfat4me to the contract? how is this accomplished?
are you actively involved in the requirements process, which includes discussions on furnishing government property to a contractor?

logistics/property
what is your governing policy for establishing an accountable property record?
do you receive copies of the dd250?
who is responsible for establishing accountable records? how is this accomplished?
do you record the original purchasing contract number on the accountable property record?
how do you ascertain the acquisition value for new procurements?
when you receive new property, do you also receive sufficient data to completely enter a new accountable property record?

finance
does the existence and completeness testing extend to the contract?
what issues have been discovered in tracing the funding to the asset?
to what extent is supporting documentation readily available for major acquisitions?

3) bibliography - dod policies, the far, army and air force regulations

survey demographics - we have chosen to use the quantitative research methodology. we will be examining at a minimum fifteen (15) contracts judgmentally selected based on the use of “lot” as a unit of measure and looking at the contract line item number (clin) structure and property clauses. based on the contracts selected, we will interview the property accountability personnel within the army and air force. personnel will include, but will not be limited to representatives of assistant secretary army (acquisition, logistics and technology (asa(alt)), deputy assistant secretary of the army (procurement) (dasa(p)), army logistics (g-4), air force (af) (logistics, installation and mission support) (af/a4l), af (financial management and comptroller) (fmc), and af (acquisition) (aq).

planned method of analysis-synthesis – for each contract examined we will look at the clin and the inclusion of mandatory clauses per the far and dfars at the time of contract issuance. each contract will be evaluated for compliance and appropriate line item structure for the type of
asset being procured. The assets will then be pulled from the property systems of the respective Services to determine when the records were created, how complete the information is, and if the supporting documentation is sufficient to support the DoD audit campaign. After examining the property information, we will establish the relationship between the contract and the property record for direct and indirect impacts on property accountability.

Presentation of the Results – The contract information will be displayed in a table format which will include the contract number, CLIN information, and description of the asset (if not expressly described in the CLIN). The compliance rate will be calculated separately to show the clause numbers and inclusion. This will also be displayed in a table format. The Questionnaire results will be summarized in the narrative and used to establish the relationship between each contract and the asset. The final results will be narrative in nature, with references to the aforementioned tables to support the conclusions.

V. Abstract

The Department of Defense (DoD) is the only major federal agency that has not complied with the law to produce financial statements for independent audit. The National Defense Authorization Act of Fiscal Year 2010 included a deadline for the DoD to be auditable in fiscal year 2017. In order to meet the deadline, the Department must improve their financial processes, controls, and related documentation. A contract between the government and a contractor is an important document that shows what was purchased, when, what it cost, and even holds authorization for a contractor to utilize government owned property.

The combination of mathematically oversimplifying the contract line items with missing government property clauses has a direct impact on appropriate property accountability. Improperly detailed and noncompliant contracts for major defense procurements cause excessive administrative burden for audit and accountability purposes. Correctly writing contracts with mandatory clauses and appropriate levels of detail decreases the workload for contract administration, financial accounting, and property accountability and management.

Due to the large size of the DoD, the following limitations are imposed upon the data selected to ensure a concise picture is obtained: accountability over equipment “in theater” will not be addressed, Government Furnished Property (GFP) will be limited in examinations, the study will focus on the Army and Air Force and selected contracts of each, Research and Development contracts will not be examined, and the class of contract will be focused on the procurement of major end items.

The core content that has been beneficial while conducting this research came from the following classes: PROC 5810 (Acquisitions Law), PROC 5830 (Pricing), and PROC 5870 (Contract Pricing and Integration). PROC 5810 primarily emphasized on all of the Federal Acquisition Regulation (FAR) parts and this has been extremely informative when looking at the property clauses and regulations. FAR Part 45, Government Property and FAR Part 31, Cost and Accounting Principles have been the primary focus. The knowledge gained from PROC 5830 has also been very beneficial as the cost of each end item is calculated and put on contract. This has a direct impact on the final acquisition value and the material. PROC 5870 is of even greater value due to the practical application of the pricing information into a contractual context.
This research will focus on the Army and Air Force processes for establishing accountable records and selected contracts of each Service. The Army and Air Force follow various DoD Instructions and manuals when establishing accountability over assets; specifically the Army follows the internal guidance established in Army Regulation (AR) 735-5, Property Accountability Policies and AR 710-2, Inventory Management: Supply Policy below the National Level and the Air Force follows the Air Force Instruction (AFI) 23-101, Materiel Management.

As part of the research, questionnaires were disseminated and completed by the Acquisition, Logistics, and Financial communities within the Army and Air Force. The purpose was to determine the impact, if any, of contract structure on property for audit readiness and property accountability. The surveyors were asked questions regarding the property accountability process; specifically they were asked about their property guidance, requirements process, policy for establishing property records, supporting documentation and new procurements.

Contracts meeting the desired parameters were filtered from the Electronic Document Access (EDA) database. Contracts were sorted by issuing office, dollar value associated by CLIN and description of asset being purchased. Construction contracts, research and development contracts, and contracts of undeterminable nature were eliminated from the sample pool. Of the remaining CLINs, 5-10 entries were judgmentally selected for further examination belonging to Army and Air Force. In order to review the contract as a whole, the base contract, all modifications and corresponding task orders were retrieved from EDA. All contracts were examined for mandatory and optional clauses related to Government property and payments and for the Item Unique Identification (IUID) clause which has applicability to equipment purchases.

As a result, the sample contracts have shown the information provided was not sufficient to establish a meaningful relationship between the procuring instrument and the accountable property record. The Department also has a compliance issue with submitting documentation to EDA, utilizing the IUID Registry, and ensuring DD 250 forms are captured through WAWF in an accessible way. The submissions to EDA can be solved by ensuring all acquisition professionals are aware that all parts of a contract, attachments especially, must be included in the system for use by other parts of the DoD.

As a recommendation for future studies, this research should be continued to show the relationship between contract CLINs that use unit of measure and unit price in a way that conforms to a well formed CLIN and further establish what relationship exists between the contract and the accountable property record. Utilization of the IUID Registry should be examined in a separate study for cause and effect relationships and to provide insight on business process improvements.

After further analysis and continued evaluation of more properly structured line items, a full conclusion should be able to be reached on the relationship between contract line item structure and the accountable property record. The full conclusion would then allow the Department of Defense to improve business processes that would strengthen the fiduciary responsibility and enhance the ability of the DoD to achieve an audit opinion.
VI. Analysis of Contract Line Item Structure and the Effect on Property Accountability

Analysis of Contract Line Item Structure and the Effect on Property Accountability

The National Defense Authorization Act of 2010 gave the Defense Department a deadline of September 30, 2017 to become auditable and meet the requirements of the Chief Financial Officers Act of 1990. In order to meet this deadline, the business processes, systems, documents, and records must be examined for sufficiency to support the financial information reported on the annual balance sheet to Congress. As part of this examination, the following research has been conducted to give an initial review of the impact of the current acquisition business practices upon the later processes of financial and accountable reporting of assets.

Contract Line Item Structure

The Federal Acquisition Regulation (FAR) 4.1001 states, “Contracts may identify the items or services to be acquired as separately identified line items. Contract line items should provide unit prices or lump sum prices for separately identifiable contract deliverables, and associated delivery schedules or performance periods. Line items may be further subdivided or stratified for administrative purposes (e.g., to provide for traceable accounting classification citations).” This description of contract line items, also called CLINs, currently provides the only guidance to contracting personnel on appropriately structuring CLINs for purchases.

The Department of Defense (DoD), within its authority to write supplemental regulations, has expanded FAR 4.1001 with detailed guidance on the establishment of CLINs. In Department of Defense Federal Acquisition Regulation Supplement (DFARS) 204.7103, “Contract line items,” criteria is further discussed and broken down into four characteristics: single unit price, separately identifiable, separate delivery schedule, and single accounting classification citation. This research focuses on the unit price and separately identifiable characteristics of CLINs and the flow down impact of structuring the CLIN in such a way as to include multiple dissimilar assets on a single line item.

A technically correct CLIN may have many forms which are based upon the type of contract, the intended procurement (services, construction, equipment/supplies, etc.), and the expected delivery date(s) of the intended procurement. Table 1 (Propert, 2014), below, demonstrates two well-formed CLINs for supply items. The description, unit of measure (“unit”), quantity and amount show definitively the expected procurement and price to be paid for each item. If the two types of screws in Table 1 were sold in packages of 20 with a unit price of $13.80 and $7.80 respectively, the unit would change to “box” or “package” to designate the larger quantity of screws per unit and the quantity would therefore change from 8,700 to 435 and from 17,400 to 870. The amount remains the same for both line items even though the quantity and unit price have been altered.
Table 1: Well-formed CLINS, Supply

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SUPPLIES/SERVICE</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>UNIT PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>3 ¾” HEX HEAD CAP SCREW GRADE 8 ALLOY STEEL HEX HEAD CAP SCREW, ZINC YELLOW PLATED, 3/8”-16 THRD, 3 ¾” L, FULLY THRD</td>
<td>8,700</td>
<td>Each</td>
<td>USD .69</td>
<td>USD 6,003.00</td>
</tr>
<tr>
<td></td>
<td>National Stock Number: C837375TBYZ:4T3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Purchase Requisition Number: W22G1F2275003L</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Federal Supply Classification Code: 5305</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Firm Fixed Price</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CIN: W22G1F2275003L0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>ACRN: AA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0002</td>
<td>2 ½” HEX HEAD CAP SCREW GRADE 8 ALLOY STEEL HEX HEAD CAP SCREW, ZINC YELLOW PLATED, 3/8”-16 THRD, 2 ½” L, FULLY THRD</td>
<td>17,400</td>
<td>Each</td>
<td>USD .39</td>
<td>USD 6,786.00</td>
</tr>
<tr>
<td></td>
<td>National Stock Number: 92620A634YWZINC</td>
<td></td>
<td></td>
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<td>Firm Fixed Price</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>ACRN: AB</td>
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</tr>
</tbody>
</table>

As demonstrated above, “unit” or unit of measure plays an important role in establishing the cost per line item and recording the unit price of an item. This extends to services as well. A service may be billed by units of time, for example month, week, or hour, or by task which implies a lump sum amount per task regardless of time spent.

FAR 32.905, “Payment documentation and process,” is directly impacted by the CLIN content and structure. Contractors must be able to submit a proper invoice which includes: contract number or other authorization for supplies delivered or services performed (including order number and contract line item number); description, quantity, unit of measure, unit price, and extended price of supplies delivered or services performed; and shipping and payment terms (e.g., shipment number and date of shipment, discount for prompt payment terms). If the contractor delivers an item or service which does not match the contract terms, the Government is not able to make the required match between the delivery and the contract. This is effectively an improper invoice, though the contractor has performed or delivered as promised and is requesting payment as appropriate.
A simplified mismatch between CLIN and invoice/delivery would be as follows. CLIN 001 states services will be rendered for a lump sum or “lot” of $1,000,000.00. The period of performance for the contract is one year. The contractor submits an invoice requesting payment for one month’s work against CLIN 001, or $83,333.00. The contractor completed one month’s work; the Government accepted and received one month’s work. This still constitutes an improper invoice because the invoice submission does not match the contract. The practice forces the Government to take additional action, varying from modifying the contract to an acceptable amount per unit to violating the improper invoice regulations and approving the invoice for payment in spite of no correlating contract or CLIN evidence.

Accountable Records

A proper invoice will have supporting Government generated documentation. The Defense Department form DD250, “Material Inspection and Receiving Report,” is the primary document for acknowledging acceptance and delivery of supplies or services to the DoD. The DD250 is also the first document used in establishing an accountable property record for those items that are subject to DoD Instruction (DoDI) 5000.64, “Accountability and Management of DoD Equipment and Other Accountable Property.” An accountable record utilizes source documents (e.g. the contract, DD250) to establish the acquisition cost of an asset and maintains that information in support of the DoD fiduciary responsibilities toward all acquired assets.

Accountable property records are required by DoDI 5000.64 as well as the DoD Financial Management Regulation, DoD 7000.14-R. These records are maintained in accountable property systems of record (APSR) which function as a subsidiary ledger to DoD accounting systems. Each DoD entity has one or more APSRs to maintain the accountable records required for appropriate financial reporting and property accountability.

The Army portion of the research is focused on information contained in Property Book Unit Supply Enhanced (PBUSE). PBUSE holds the accountable information for equipment that has been issued to a unit. PBUSE is also part of the Army’s network of systems that establish the total Army fiduciary responsibility. The Air Force portion of the research is focused on information contained in Air Force Equipment Management System, or AFEMS. AFEMS, like PBUSE, is part of the Air Force fiduciary systems. These two systems are the target recipient systems for accountable property information.

Accountable records are the basis for establishing the acquisition cost and valuation of assets in support of the Chief Financial Officers Act (CFO Act) of 1990. The CFO Act of 1990 requires all executive agencies to have auditable business processes and produce financial statements similar to those produced by private or commercial entities. The DoD has implemented guidance to assist in developing valuation techniques, appropriately conducting audits, having sufficient records and documentation, and other processes to support fiduciary accountability.

Process for Establishing Accountable Records: DoD

The DoD has high level guidance detailing the way acquisitions should happen and the trail that leads to an accountable record. DoD purchases typically begin with some form of
contract. The contract gives the terms and conditions that bind both the contractor and the Government to an agreed upon outcome. During the course of a contract, accountable property may be procured. The property may be delivered at many points in time through the life of the contract, depending on the situation and contract terms. The major events to focus on are “acceptance” and “receipt” for these new items.

The acceptance and receipt events have different operational meanings between the contracting community and the logistics community. In the contracting community, acceptance is the more important event. This is where the Government officially states the property meets the terms and conditions set forth in the contract and thereby begin the Government’s fiduciary responsibility toward that asset or assets. For the logistics community, receipt constitutes the act that begins the record keeping and fiduciary actions. Both actions require Government personnel to perform a task and to generate specific documentation. The larger concern for this study is acceptance. The acceptance documentation is the DD 250 which is the primary document for establishing accountable property records.

An accountable property record needs to contain the posting reference for an asset that has been entered into an accountable property system. This posting reference refers to the original contract, typically addressed as the procurement instrument identification number (PIIN), the original DD 250, or, when as asset is transferred or acquired through an alternate method, the document that was used to bring the asset into the inventory. As the asset matures in the inventory, the posting reference may also refer to other transactions which may change the useful life of that asset. Overhaul, modification, and refurbishment are a few examples and the posting reference would reflect the document that supports the change.

Receipt is focused on the physical receiving of an item. This is typically thought of in a warehouse environment, but can happen anywhere property can be delivered. Receipt is often the impetus for establishing the accountability record, though the Government responsibilities are assumed at acceptance.

**Process for Establishing Accountable Records: Army**

The Army follows the internal guidance established in Army Regulation (AR) 735-5, AR 710-2, and various DoD Instructions and Manuals when establishing accountability over assets. Through the questionnaire, requesting information from the Army, a respondent provided the following information on establishing accountable records: [to establish acquisition value] “You use the contract or original DD Form 1155, DD Form 250, SF 44, DD Form 1149, SF 1449 or vendor invoice.” The Army also uses FED LOG or contract information to determine what unit of measure may be required for an asset. “FED LOG is a CD-ROM or DVD tool to retrieve management, part/reference number, supplier, Commercial and Government Entity (CAGE), freight, Interchangeability and Substitutability (I&S) and characteristics information recorded against National Stock Numbers (NSN). FED LOG also provides service unique data for additional search capabilities.” (Defense Logistics Agency Information Service, 2014) The Army also has an extensive cataloging process which can ease or slow the establishing of an accountable property record depending on the type of item and whether it has been previously cataloged.
The Army has several systems in which property information is maintained. PBUSE has already been identified, and Army also uses Defense Property Accountability System (DPAS), Logistics Modernization Program (LMP), and plans to migrate to Global Combat Support System (GCSS) Army. Regardless of the name, the system must be able to maintain sufficient fiduciary information to support capitalization, depreciation, and acquisition value in addition to any managerial aspects required for the property in question.

**Process for Establishing Accountable Records: Air Force**

The Air Force follows Air Force Instruction (AFI) 23-101 when establishing accountable records for assets. Air Force also utilizes Defense Logistics Agency (DLA) to assist in receiving assets and data. The acceptance process is often accomplished for Air Force by DLA at retail locations and by Defense Contract Administration Agency (DCMA) when performed at origin, typically the contractor’s facility. Each Air Force installation is responsible for establishing accountable records using the receipt process. DLA establishes accountability records at wholesale activities also using the receipt process. All Air Force property has an Accountable Officer identified in writing. (Air Force Questionnaire, Appendix II)

The current process in place for establishing the acquisition cost for items begins with the item manager. The item manager is responsible for establishing a catalog price which is then pushed to accountable property systems of record (APSR). This process is going to be enhanced through planned electronic interfaces with WAWF to establish stronger relationships between the contract information and the purchased equipment. The Air Force questionnaire response added the following insight: “The documentation that comes with the property is sufficient to establish a new accountable record for all property. However, the documentation is not sufficient to establish the financial accounting data for equipment. We are developing an electronic interface with WAWF to capture the additional information required for financial reporting.”

**Contract Analysis Method**

Contracts meeting the parameters of “lot” unit of measure combined with a description of “equipment” were filtered from the Electronic Document Access (EDA) database. The EDA stores official copies of all contracts issued by the DoD. The sample retrieved from EDA had more than 75,000 contract line items returned. Contracts were sorted by issuing office and dollar value associated by CLIN. Contracts were further filtered by description of asset being purchased. Construction contracts, research and development contracts, and contracts of undeterminable nature were eliminated from the sample pool. Of the remaining CLINs, 5-10 entries were judgmentally selected for further examination for issuing offices belonging to Army and Air Force. The base contract and all modifications were retrieved from EDA, and in certain cases the task order and all modifications were also pulled from EDA to review the contract as a whole.

All contracts were examined for mandatory and optional clauses related to Government property and payments. The line items were evaluated to determine if sufficient supporting evidence within the contract was present to ensure appropriate purchases and payments were
being made. The owning entities of the property were contacted for confirmation the property in question was delivered and accountable records were established. A questionnaire was also provided to the headquarter level of both Army of Air Force for supporting narrative of the process as it is supposed to occur.

All contracts were examined for the Item Unique Identification (IUID) clause which has applicability to equipment purchases (DFARS 252.211-7003). Regardless of inclusion of the clause, each contract in the sample was used as a search parameter within the IUID Registry for any and all data associated with the sample contract. The contract information contained within this document is redacted to sufficiently ensure no proprietary information is inadvertently disclosed.

**Contract Data Analysis: Army**

The Army contracts in the sample tended to be master contracts, for example a blanket purchase agreement (BPA) or indefinite delivery/indefinite quantity (IDIQ), with multiple task or delivery orders placed underneath. The task orders (TO) comprised the results within the sample, however the master contract was also examined for flow down clauses or other data which would affect a TO.

The first contract analyzed was to purchase a specific type of weapon, which has been redacted to say “specialty gun” for the purposes of this study. This specialty gun meets the requirements to be capitalized on the financial statement (DoD 7000.14-R, Financial Management Regulation, Volume 4 Chapter 6), is an accountable asset (DoDI 5000.64), and meets requirements for IUID (DoDI 8320.04). The contract CLINs as displayed in Table AR 1-1 (see Appendix I), though not entirely well formed, do display an effort at establishing a unit price and quantity of assets to be purchased. Subsequent modifications call into question the validity of the unit price established. An administrative modification changed both CLIN 0001 and 0002 by subtracting from one to add to the other. The overall amount of the contract did not change; but there was an issue with the submitted invoice that the Government approved and subsequently caused a contract modification.

In the data retrieval phase of the research regarding this contract, it was noted that no assets were registered with the IUID Registry. A sample of receiving reports was pulled from Wide Area Workflow (WAWF) for this contract. Receiving reports are the documents used in WAWF for taking delivery of property on a contract. None of the receiving reports held sufficient information to understand what property was being accepted by the Government, nor was IUID information contained on the submissions though the capability exists.

The second sample required the contractor to provide, install, and configure items and equipment per an attachment to the contract (Appendix I: Table AR 2-1, Task Order CH05). The attachment to the contract was not loaded in EDA to allow an analysis of price, item, quantities, or other property related data. (DFARS PGI 204.201) Contract attachments are required to be uploaded in EDA as they are inherently part of the contract as a whole.
The information in the IUID Registry, however, was abundant for this particular contract. There was a wide variety of CLIN numbers uploaded into the Registry. Our sample contract contained only CLIN 0001 which had relevance to delivered property. The Registry information for the same contract number had 99 different entries for CLIN number (Appendix I, Table AR 2-2). This variance is due to the issuance of multiple TOs and the lack of populating the field for delivery/task order that is available in the Registry. This means any asset under any TO for the parent contract could correctly have populated information under the CLIN entry; without the TO number, it is impossible to determine from the Registry data which TO in particular was the purchasing mechanism.

The WAWF data for the parent contract was queried as well. No receiving report documents were available for the TO in our sample. This contract TO, therefore, had no attachments available, no supporting delivery documents, and no directly matching IUID Registry data to support the purchase of any equipment by the Army.

The third Army contract in the sample involved several task orders under an IDIQ ordering contract. (Appendix I, Table AR 3-1) Unlike the previous contracts, information from WAWF was available for two or the four task orders issued under this parent contract within our sample. The distinction in the WAWF information is receiving reports were not available, but files called “Invoice 2 in 1” were present. “Invoice as 2 in 1” submissions are to be used for services only. The appropriate WAWF transaction for both services and property would be an “Invoice and Receiving Report (Combo).” Property was definitely delivered on the sample invoices retrieved from WAWF as determined by the CLIN and the description on the invoice. (Appendix I, Table AR 3-3).

Like the preceding contract, IUID information was available for the parent contract, but no defining attributes for the TO were provided with the asset identifiers. (Appendix I, Table AR 3-2) As with the previous examples, we are unable to determine the impact or requirements for IUID based on the information provided. There were 756 entries attributable to CLIN 0001 but only the parent contract number is available to distinguish the property.

The fourth Army contract had insufficient information to utilize in analyzing the contract. The TO in the sample, KH06, had no supporting documentation in EDA, no entries in the IUID Registry, and no results in WAWF. There were no electronic sources to be retrieved to support the obligation and expenditures for just under $4.75 million in Army funds despite clear and specific instructions for WAWF to be used for all invoices in this TO. A full query in WAWF was run and nothing could be attributed to TO KH06 under the master contract.

The final contract examined in the Army sample is an IDIQ contract with multiple task orders for a variety of items and services. (Appendix I, Table AR 5-1) The first TO in the sample was a cancelled contract; no expenditures were made and no property was delivered. The second TO was outside of the scope of the analysis due to it being awarded in a contingency environment. The third and fourth TO were within scope and are part of the analysis.

TO 77 required the vendor to produce a portable building with backup generators. Portable buildings are considered equipment, not real property, due to the ability to disassemble
and reassemble the unit in multiple locations. (DoDI 4165.56, Relocatable Buildings) The contract has contradictory instructions in the directions to the contractor regarding delivery documents: “The contractor shall provide DD250 Forms and the list of furniture and equipment (including serial numbers) with by-item costs and total costs for the facility and components to the POCs below one month prior to the delivery and transfer.” The vendor is expressly told through contract clause DFARS 252.232-7006 to utilize a Combo WAWF document. This document includes both an Invoice for labor/services and a Receiving Report for property. Providing the DD 250 form prior to delivery and outside of WAWF creates a contract compliance issue and duplicated efforts on the part of the contractor. (The form recipient was not identified as a contracting official or delegated representative in the contract.)

The WAWF documents were pulled for TO 77 to include supporting documents (attachments) submitted in the invoice process. There were several items of note. One invoice was rejected by the Government for the vendor’s failure to follow invoice instructions. A hard copy of a signed DD 250 was included in the attachments. The DD 250 was highly summarized as to the items being delivered.

TO 79 was for multiple CLINs to purchase equipment, and like many other sample contracts did not include any attachments in EDA by which an analysis of property to be purchased could be performed. However, within WAWF the vendor provided an attachment that contained both a DD 250 (without unit costs or prices) and an itemized list with serial numbers for all equipment obtained and delivered to the Government. This list was provided to the Army with a request to validate that property records exist. At the time of publication, the Army had not yet finished the task and responded with results.

**Contract Data Analysis: Air Force**

The first contract in the Air Force sample was a combined service and equipment contract for information technology (IT) installation, configuration, and hardware to be performed at two Air Force bases. The technical details, to include equipment items, were not included in the contract documentation. An analysis of the amendments to the contract revealed the contract was terminated for convenience (T4C) by the Government. Information about payments exists in WAWF, but it was unable to be determined what physical items were delivered and installed.

The second contract in the Air Force sample also combined services and equipment on a single CLIN. Similar to the first contract, the vendor was tasked to install a radio system on multiple Air Force bases. The sample documentation from WAWF showed that the vendor billed in a way that matched the contract structure, but did not show details on the equipment delivered and installed at the Air Force bases. The IUID clause was included in the contract, however no information about the property was able to be retrieved from the IUID Registry.

The next contract is very different from the previous contracts. This contract requires the vendor to “provide all personnel, equipment, tools, materials, supervision, and other items or services necessary to perform an Internet-based Contractor Operated Parts Store (ICOPARS).” The documentation contained in EDA did not extend to the actual details of the vendor requirements. It was unable to be determined if the vendor would be selling commercial items,
Government furnished items, or a combination thereof. It was also unable to be determined if the vendor would be operating a retail environment on behalf of the Government or if this was to be a contractor operated inventory control point.

The documentation sample from WAWF did not provide sufficient information to determine what property may have been acquired. The descriptions of the purchases show automotive parts, war readiness materials, and other general property terms, but there is no breakdown of the property or the cost of the property.

The next contract had information contained within the work statement to provide quantities and types of items to be procured by the vendor. The equipment and services were all IT in nature, but there was no IUID clause included in the contract. A sample from WAWF showed the billing to match the CLIN structure in the contract, and no additional documentation was provided in the sample.

Continuing the IT theme, the Air Force’s next sample contract was for ruggedized notebooks. The CLIN description had a quantity listed, the part number, and also the quote number from which the cost information was presumably applied. The contract contains the IUID clause as well. The unit cost per ruggedized notebook is unknown based on the information retrieved from the contract, though there was apparently enough information to accept a vendor quote and establish a “lot” price for the CLIN.

The WAWF data supports the matching payment of the full contract amount in a single invoice, however there was no documentation to support the quantity of notebooks delivered. Also, no entries were discovered in the IUID Registry for items under this contract number.

The next Air Force purchase was for flight crew body armor. The original contract listed each size, gave a unit price, and listed a quantity to be purchased. A later modification changed the contract format to change the unit price to a “lump sum” style of contract. When examining the WAWF sample, it was noted that the first submission matched well: the quantity delivered and the unit price reflected the CLIN structure and allowed for a partial shipment. By the final WAWF submission, the invoice reflected a single entry to encompass multiple CLINs with unknown quantities associated in the final delivery. The Government allowed this invoice to be processed as submitted.

The final three contracts are so similar, individual descriptions are not required. All are for IT equipment, all have a list of the quantities and types of items to be purchased, all have a “1 lot” CLIN structure, and all have no cost information associated with the items to be purchased. The IUID clause is not itself present, but two of the three contracts put unique marking requirements in the text of the work statement. None of the contracts had any property registered in the IUID Registry, and all the WAWF invoices matched the contract without additional documentation on the equipment delivered.
Summary of Analysis

Table 2, below, summarizes the contract, IUID requirements and results, property descriptions, available WAWF data, and the ability of the Army or Air Force to provide confirmation on the delivery and property records associated with the sample contracts.

Table 2: Summary of Findings

<table>
<thead>
<tr>
<th>Contract</th>
<th>IUID Clause</th>
<th>IUID Results</th>
<th>Property to be delivered</th>
<th>WAWF data</th>
<th>Able to validate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>W15QKN-08-C-####</td>
<td>Yes.</td>
<td>None</td>
<td>Specialty gun</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>TO 1</td>
<td>No.</td>
<td>None</td>
<td>Gun mounts</td>
<td>None</td>
<td>No</td>
</tr>
<tr>
<td>TO 2</td>
<td>Yes.</td>
<td>None</td>
<td>Gun mounts</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>TO 4</td>
<td>No.</td>
<td>None</td>
<td>Clamps</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>W91QUZ-07-D-####</td>
<td>Yes.</td>
<td>None</td>
<td>Master Contract</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TO KH06</td>
<td>Flow down</td>
<td>None</td>
<td>Unable to determine.</td>
<td>None</td>
<td>No</td>
</tr>
<tr>
<td>W91QUZ-07-D-####</td>
<td>Yes.</td>
<td>2011</td>
<td>Master Contract</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TO CH05</td>
<td>Flow down</td>
<td>None</td>
<td>Unable to determine.</td>
<td>None</td>
<td>No</td>
</tr>
<tr>
<td>W9113M-07-D-####</td>
<td>Yes.</td>
<td>None</td>
<td>Master Contract</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TO 57</td>
<td>Flow down</td>
<td>None</td>
<td>Outside of scope</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>TO 77</td>
<td>Flow down</td>
<td>None</td>
<td>Building and generator</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>TO 79</td>
<td>Flow down</td>
<td>None</td>
<td>IT equipment</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>FA2517-11-F-####</td>
<td>Yes.</td>
<td>None</td>
<td>IT Equipment</td>
<td>None</td>
<td>T4C</td>
</tr>
<tr>
<td>FA4800-11-C-####</td>
<td>Yes.</td>
<td>None</td>
<td>Equipment, 1 Lot</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>FA4803-11-D-####</td>
<td>No.</td>
<td>None</td>
<td>Unable to determine.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>FA4814-10-F-####</td>
<td>No.</td>
<td>None</td>
<td>Quantities described in work statement.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>FA4890-12-P-####</td>
<td>Yes.</td>
<td>None</td>
<td>Ruggedized Notebooks.</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>FA6643-08-F-####</td>
<td>No.</td>
<td>None</td>
<td>Body Armor</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>FA7014-14-C-####</td>
<td>No.</td>
<td>None</td>
<td>IT equipment</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----</td>
<td>------</td>
<td>--------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>FA8751-13-C-####</td>
<td>No clause, but in PWS</td>
<td>None</td>
<td>IT equipment</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>FA8751-13-C-####</td>
<td>No clause, but in PWS</td>
<td>None</td>
<td>IT Equipment</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Relationship between the Data and the Property Record**

An accountable property record is comprised of the following data elements: name, part number, description (noun or nomenclature), model number, national stock number, owner, status (e.g., active or inactive (retired), staged, stored, in-transit, transferred, declared excess, awaiting disposal, disposed of), quantity, unit of measure, general ledger classification, value at full cost and depreciation information (for capitalized assets), original acquisition cost (for non-capitalized assets), estimated useful life, unique item identifier or recognized equivalent, date placed in service, location, current condition, posting reference, transaction type (e.g., received, accepted, inventoried, transferred, shipped, retired, disposed), and transaction date. (DoDI 5000.64) Many of these data elements should be obtained from the contract or documents generated through a contract administration action. Table 3 shows the potential to retrieve a data element from either the contract or a supporting document (e.g. DD 250).
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Part Number</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Model Number</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>National Stock Number</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Owner</td>
<td>Not Reliably</td>
<td>Yes</td>
<td>Yes</td>
<td>The end recipient or owner may be determined late in the process.</td>
</tr>
<tr>
<td>Status</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Quantity</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Contract says intended quantity, not actual</td>
</tr>
<tr>
<td>Unit of Measure</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>General Ledger Classification</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>This requires judgment by the owner.</td>
</tr>
<tr>
<td>Value at Full Cost</td>
<td>Yes, if only one contract</td>
<td>No</td>
<td>No</td>
<td>Full cost typically requires multiple sources.</td>
</tr>
<tr>
<td>Acquisition Cost</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Useful Life</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Found in engineering documentation or FMR</td>
</tr>
<tr>
<td>IUID</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Date Placed in Service</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>New delivery implies ready for use</td>
</tr>
<tr>
<td>Condition</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Posting Reference</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Transaction Type</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Transaction Date</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Seven of the twenty data elements could reasonably be expected to come from the contract, and fourteen of the twenty could reasonably be expected from supporting contract documentation. Two of the data elements require either calculation or judgment in order to be established. Overall, more than 75% of the required data obtainable through an electronic or
other static source could be determined through the contract and supporting contract documentation.

**Impact to Valuation of Assets**

Asset valuation and acquisition cost are highly dependent on the purchasing method and supporting documentation. Valuation itself has multiple methods of obtaining the full cost for a capitalized asset. Contract-based valuation intends to use the contract as the basis for forming the full cost of an asset. The full cost includes all costs incurred to bring the asset to a form and location suitable for its intended use. Government furnished property used on a contract has an impact to the full cost of an asset, as well.

DD 250s, which are submitted by contractors when assets are delivered and tracked in WAWF, provide asset value information. While valuation based on the DD 250 is relatively straightforward, analysis has shown that the value included on the DD 250 may be based on a CLIN and may exclude other significant program costs that should be included in the asset value, potentially resulting in a material undervaluation for the end item. These additional costs are frequently included on other CLINs. The program manager must ensure that the DD 250 developed value includes all appropriate contracts and CLINs. (USD (AT&L), General Equipment Valuation Estimation Methodologies, 2014)

Valuation based on contract information alone involves valuing assets using the pricing data included in contracts. A complete understanding of the acquisition program including the structure of all related contracts is required to implement this methodology. Components must align costs with individual assets and determine the contractual costs that should be included in the asset’s value versus those that should be excluded. This can be extremely challenging, particularly when the costs to be capitalized are included in multiple Contract Line Items and multiple contracts. (General Equipment Valuation Estimation Methodologies, USD(AT&L), 2014)

The above two methods of valuation demonstrate the significance of the contract in terms of accuracy and validity for establishing the full cost for an asset. Though not as complex as full cost, acquisition cost is also highly dependent upon contracts and the subsequent delivery documentation. The DD 250 may be based entirely on the CLIN information, or may be a partial cost which does not indicate the actual acquisition cost of an item. It is highly dependent on the knowledge or experience of the person completing the form to include sufficient information to establish an acquisition cost.

As demonstrated through the sample of 18 total contracts, only one entry of the entire population yielded enough information to attempt a reconciliation between the original purchasing contract and the property received. Nine of the contracts provided some information on quantities to be received, though not all at the CLIN level. Four of the contracts had a unit price embedded somewhere in the text of the contract that could serve as an acquisition cost. No usable results were obtained from the IUID Registry.
Conclusion

The sample contracts have shown the information provided was not sufficient to establish a meaningful relationship between the procuring instrument and the accountable property record. The study must be continued to show the relationship between contract CLINs that use unit of measure and unit price in a way that conforms to a well formed CLIN as documented in Table 1 and further establish what relationship exists between the contract and the accountable property record.

The Department also has a compliance issue with submitting documentation to EDA, utilizing the IUID Registry, and ensuring DD 250 forms are captured through WAWF in an accessible way. This is most likely due to a combination of education and electronic capabilities. The submissions to EDA can be solved by ensuring all acquisition professionals are aware that all parts of a contract, attachments especially, must be included in the system for use by other parts of the DoD. Utilization of the IUID Registry is a more complex issue and should be examined in a separate study for cause and effect relationships and to provide insight on business process improvements.

The accessibility of the DD 250 is more broad in the ways the issue could be addressed. Part of the use of the Receiving Report in WAWF is related to a contracting officer putting the correct instructions for the use of WAWF in the contract. A contractor receives instructions on the appropriate forms to use in WAWF and relies on the contract for those instructions. The system will allow for multiple methods of uploading information, and technical “work arounds” or other partially correct uses of the system could be employed to achieve the result of contract payment. The Government must also practice vigilance to ensure the information in WAWF conforms to the contract and also is submitted in a way other systems could capitalize upon the data submitted.

After further analysis of the above three observations and a continued evaluation of more properly structured line items, a full conclusion should be able to be reached on the relationship between contract line item structure and the accountable property record. The full conclusion would then allow the Department of Defense to improve business processes that would strengthen the fiduciary responsibility and enhance the ability of the DoD to achieve an audit opinion.

VII. Bibliography

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Federal Management Regulation, 41 C.F.R. 102 (Current edition)


BIO:

Amber Propert, CPPS, CDFM is the former Amber Barber. Mrs. Propert works as a program analyst and accountability specialist for the Department of Defense, Office of the Under Secretary of Defense for Acquisition, Technology and Logistics in the Property & Equipment Policy Office under the direction of the Director, Acquisition Resources and Analysis. The above article represents her opinion and is not the view of the Department of Defense nor should be treated as formal guidance.
Introduction

Risks are present at every stage of the supply chain, and have steadily become a larger business driver in every industry, including pharmaceuticals. Warehousing and distribution operators, and their parent companies, need to understand the overall level of risk embedded within their processes and activities. To understand and mitigate these risks, facilities must utilize a comprehensive approach to risk. Strong risk management can improve the efficiency and efficacy of a facility by improving:

- Compliance
- Assurance
- Decision-making

The International Organization for Standardization (ISO) lays out a comprehensive risk framework in ISO 31000 which has been accepted across industries worldwide. To apply this framework, it is important to consider the specific context of the operations and facility being evaluated. After establishing context, the risk framework moves into the assessment phase, consisting of risk identification, analysis and evaluation. The subsequent step is risk response. Responses typically include mitigation strategies to underwrite the dangers or concerns involved. Throughout each step of the framework, risks and strategies should be monitored, reviewed, communicated to all those involved and continuously improved.

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Assessment and Response Framework

Risk Identification

In medical warehousing, several risks need to be considered and, perhaps more importantly, a methodology for tracking these risks must be established. A risk assessment exercise should be one of the very first steps an organization takes when designing a warehouse facility. The warehouse design phase itself involves the identification of several risks, and the creation of an overall plan to mitigate these risks. Further analysis of industry trends and leading practices related to the warehousing industry will identify common risks which occur throughout the industry—these must also be considered when planning and designing any warehouse.

Table 1—Identified Risks

<table>
<thead>
<tr>
<th>Natural Disasters</th>
<th>Chemical Disasters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood</td>
<td>Fire</td>
</tr>
<tr>
<td>Earthquake</td>
<td>Contamination</td>
</tr>
<tr>
<td>Windstorm</td>
<td>Infestation</td>
</tr>
<tr>
<td>Epidemic</td>
<td>Product Expiry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational Errors</th>
<th>Human Disasters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product damage</td>
<td>Employee malfeasance</td>
</tr>
<tr>
<td>Mis-shipments</td>
<td>Theft</td>
</tr>
<tr>
<td>Inventory discrepancies</td>
<td>Work Stoppage</td>
</tr>
<tr>
<td></td>
<td>Death or disability of key executives</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer Retention</th>
<th>Utility Failures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankruptcy</td>
<td>Power outage or Surge</td>
</tr>
<tr>
<td>Management change</td>
<td>Disruption of water/gas supply</td>
</tr>
<tr>
<td>Market change</td>
<td>IT/telecoms failure</td>
</tr>
<tr>
<td>Litigation</td>
<td>Mechanical breakdown</td>
</tr>
<tr>
<td></td>
<td>Disruption of road/rail access</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplier Failures</th>
<th>Government Disasters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delays</td>
<td>Civil disobedience or riots</td>
</tr>
<tr>
<td>Quality issues</td>
<td>War and insurrection</td>
</tr>
<tr>
<td>Raw Material Shortage</td>
<td>Sanctions</td>
</tr>
<tr>
<td>Business continuity</td>
<td></td>
</tr>
</tbody>
</table>

Several of these risks lie almost entirely outside an organization’s control, such as natural disasters and government disasters. Moreover, not every warehouse experiences the same types of risks. This article will detail the risks most relevant to the medical warehousing industry. Several threats to an organization exist within the organization’s control, such as certain operational errors and human disasters. Recurring risk identification meetings can enable an organization to brainstorm based on recent market and industry sector intelligence and anticipate potentially harmful scenarios and their associated problems. These meetings may occur at several levels of the organization and should focus on identifying potential risks, keeping key
stakeholders aware of these risks, and creating remediation strategies to mitigate these risks as much as possible in the future. Supply chain risks identified at team meetings can be further categorized into four primary groups: macro-environment, extended value chain, operational, and functional risks. The focus here is simultaneously on reducing costs and risks.iv

Identifying, tracking, and reducing these risks across the enterprise leverages total efficiency and promotes a stable and fully-functioning warehouse facility in the long term. However, the risks outlined in Table 1 do not apply to every warehouse. Warehouse risk varies greatly depending on facility-specific details—i.e. the types of products the warehouses handles and where the warehouse is physically located. Thus, it is critically important for the organization to identify the risks most relevant to its specific warehouse. The following sections identify and expand upon risks, especially those relevant for the medical warehousing industry.
Risk Response

Role of Risk Response within a Risk Management Strategy
After risks have been identified and rigorously assessed, businesses must choose how to respond to each potential event. During the risk assessment phase, the likelihood and potential impact of an event are dimensions used to prioritize risk response efforts. The four common risk response approaches are: avoid, mitigate, transfer, and accept.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid</td>
<td>Risk avoidance centers on reducing the likelihood of an event.</td>
</tr>
<tr>
<td>Mitigate</td>
<td>Risk mitigation reduces the organizational impact if an event does occur.</td>
</tr>
<tr>
<td>Transfer</td>
<td>Transferring risk involves shifting a risk to another partner in a supply chain. Businesses should work collaboratively across a supply chain to balance risk effectively amongst partners.</td>
</tr>
<tr>
<td>Accept</td>
<td>Accepting risk is a conscious decision to choose not to act for a given risk event. The decision to accept a risk should only be made if a rigorous assessment of the cost, benefits, and uncertainty for the risk are understood by all impacted parties.</td>
</tr>
</tbody>
</table>

Table 2—Risk Response Approaches

Risk responses should be reviewed periodically as part of a broader risk management strategy. Evolving internal and external forces can require changes in risk response approaches even if the underlying risk event remains constant. For example, new regulations can force an organization to mitigate a risk previously accepted by the warehouse. Risks transferred to other supply chain partners should continue to be monitored. As the operational competencies and the financial stability of supply chain partners change over time, risk responses should also change to keep pace with the new environment. The World Health Organization (WHO) states routine independent audits should be conducted to ensure compliance with agreed risk response approaches.

Risk Response for Medical Warehouses
Medical warehouse operations face unique supply challenges due to the high product value, threat of counterfeit products, and stringent regulatory environment. These three challenges favor active risk response approaches (avoid, mitigate) instead of the passive risk response approaches (accept, transfer) used in traditional warehouse operations.

Security vulnerabilities of any supply chain partner are a vulnerability for the entire supply chain. The challenge of counterfeit product necessitates the need for system-wide control and visibility. Traditional warehouse operations frequently rely on visual inspection and sampling to satisfactorily verify the quality of inbound product. These methods are not sufficient to fully address the security concerns associated with moving pharmaceuticals. Additional management controls and a collaborative approach between supply chain partners are required to avoid and mitigate risks.
To facilitate collaborative risk management, partners can employ common standards and systems. Common standards enhance communication and understanding of system-wide risks. Supply chain partners should jointly decide on a common standard based on their operating environment.\textsuperscript{vii}

<table>
<thead>
<tr>
<th>Standards</th>
<th>Description</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 31000:2009</td>
<td>This international Standard provides principles and generic guidelines on risk management.</td>
<td>Focuses on leveraging risk management for organizational strategic decisions</td>
<td>Light on interdependences and compound effects of multiple risks</td>
<td>This standard can be used by any public, private or community enterprise, association, group or individual.</td>
</tr>
<tr>
<td>OCEG “Red Book” 2.0: 2009</td>
<td>A Governance, Risk and Compliance Capability Model</td>
<td>Integrates governance into risk processes and is supported by a common technology platform</td>
<td>Lack of root cause analysis and unclear ownership for assigned risks</td>
<td>Relevant in all industries and sectors and affects all functions in a modern enterprise.</td>
</tr>
<tr>
<td>BS 31100: 2008</td>
<td>Code of Practice for risk management.</td>
<td>Similar to ISO 31000:2009, focuses on leveraging risk management for organizational strategic decisions</td>
<td>Minimal discussion of business continuity planning</td>
<td>Used by all industries and sectors to ensure organization meets objectives and manages risk.</td>
</tr>
<tr>
<td>COSO: 2004</td>
<td>Enterprise Risk Management - Integrated Framework</td>
<td>Emphasizes involvement of Senior Leadership in Risk Management processes</td>
<td>Minimal discussion of root cause analysis and business continuity planning</td>
<td>Relevant in all industries to ensure organizations incorporate an internal control framework to help manage risks</td>
</tr>
</tbody>
</table>

Table 3—International Risk Management Standards
Common standards are useful starting points for understanding system-wide risks. However, available standards are typically conceptual and offer minimal guidance on implementation. It is important to keep this in mind and consider additional risks across the supply chain when implementing these standards to achieve the desired benefits sought by the organization.

**Continuous Improvement**

While assessing risk and creating a risk management framework are essential, industry standards such as ISO 31000 are now increasingly emphasizing continuous improvement in risk management. Medical warehouses should not only set performance goals and measures, but also review and modify processes, systems, and resources regularly based on those indicators.\textsuperscript{viii}

When an incident occurs, a root cause analysis should be conducted. Once the root cause is identified, the appropriate follow-up action should be implemented. These actions can include additional training surrounding the issue areas identified or can result in changes to a Standard Operating Procedure (SOP). If the incident is part of a growing trend or considered a particularly high-risk category, many companies will develop Corrective Action Plans (CAPs) which pinpoint a particular SOP sub-process and build out additional guidelines for those involved.

**Security**

**Risks to Manage**

**Theft**

Given the rising costs of healthcare, one of the fastest-rising concerns for medical warehouse managers is theft. In March 2010, a group of men was arrested by the United States government for allegedly breaking into a Connecticut medical warehouse and stealing approximately $80 million in pharmaceuticals.\textsuperscript{xix} The group procured a tractor trailer and parked it in one of the warehouse’s loading docks; this area was one of the only zones beyond view of the warehouse’s surveillance cameras. With the help of a ladder, at least two other men made their way to the roof. They proceeded to cut a hole and rappel into the warehouse. Ultimately, the men were able to disable the security system, and depart with a staggering $80 million in product. This disastrous event highlights how important security monitoring has become for organizations involved with medical warehousing.

To protect against these events, the United States Food and Drug Administration (FDA) has mandated minimum security requirements for the storage and handling of prescription drugs.

These security standards, which were last updated on April 1, 2015, dictate that:\textsuperscript{xv):

1. All facilities used for wholesale drug distribution shall be secure from unauthorized entry.
   a. Access from outside the premises shall be kept to a minimum and be well-controlled.
   b. The outside perimeter of the premises shall be well-lighted.
   c. Entry into areas where prescription drugs are held shall be limited to authorized personnel.
2. All facilities shall be equipped with an alarm system to detect entry after hours.

3. All facilities shall be equipped with a security system that will provide suitable protection against theft and diversion. When appropriate, the security system shall provide protection against theft or diversion that is facilitated or hidden by tampering with computers or electronic records.

4. Written policies and procedures shall be established, maintained, and adhered to in regards to loss or thefts.\textsuperscript{xii}

Enforcement of the FDA’s standards is a crucial first-step in assuring medical warehouses maintain at least a minimum level of security. It is at the warehousing organization’s discretion to decide the specific steps implemented to maximize its security levels. Towards this end, separation of duties serves as a key internal control and should be implemented across all areas to help ensure no individual is responsible for an entire process. Adequate systems should also be in place not only to monitor receipt, storage, and distribution of the product in general, but also to help ensure no foul-play occurs. Deterrence has taken many forms for theft and other risks— notably some organizations choose to draw less attention to shipments as they are transported between facilities. Many distributors are now using unmarked and unbranded vehicles to reduce risks of theft and substitution of valuable shipments. Every security precaution available to medical warehousing organizations should be taken to deter theft.

In addition to the enforcement of FDA standards, frequent and productive collaboration with insurance providers can reduce an organization’s insurance premiums. As a basic rule of thumb, if insurance providers consistently see an organization is proactively working to eliminate risk at all levels, they will lower initial rates. This is an enormous cost-saving opportunity for warehouse organizations. In the long run, collaboration with insurance providers can potentially save the organization large sums.

**Counterfeiting and Substitution**

According to the World Bank, approximately 10% of the world’s drug supply is counterfeit.\textsuperscript{xii} With such a high percentage, managing the risk of counterfeit drugs has become a central component of all pharmaceutical supply chain operations, warehouses notwithstanding. Identification is the first step. By mapping out processes and the relevant actors in those processes, counterfeiting vulnerabilities can be identified and mitigated. One leading practice identified utilizes “Deter, Detect, Disrupt” as the stages associated with counterfeit operations. Industry leaders are moving to systems which track all counterfeit products in place and rapidly isolate suspect products. These tracking systems are often the main component of deterrence as well. The disruption phase comes as part of the isolation of those products, and the management plan which takes place after an incident has occurred.
Case Study: Bilcare Research

By utilizing nanotechnology, Bilcare Research created a tamper-evident, non-clonable tag for every product and package in its supply chain. By incorporating an identifier similar to a unique fingerprint, the tag could not be duplicated. Warehousing staff and end users such as hospitals, pharmacies and even patients could use a scanner to confirm the authenticity of the product. These tags were inexpensive to make, remove risks of duplication, and can save pharmaceutical companies millions lost substitution and theft.xiii

The detection systems, often known as “track and trace systems”, are becoming more sophisticated and cover a myriad of categories, ranging from security features such as serialization or evidence of tampering to technological solutions such as radiofrequency identification (RFID) tags, and bar codes.xiv The latter category is not only enabling authentication for counterfeit drugs but is also preventing diversion and theft with real-time visibility. RFID tags allow manufacturers and distributors to track and trace drugs as they progress through the drug supply chain by their batch number. A batch numbers is an FDA required designation printed on the label of a drug or medicine that locates the batch and allows the production or manufacturing history of batch plus all stages of manufacturing and control need to be reviewed and traced.xv When a RFID tag is scanned the batch number contains information that allows the barcode reader to verify a product’s authenticity by detecting counterfeits. These technologies are effective measures to help ensure that all products are authenticated.xvi Both tags and barcodes attached to the packaging of a product create an electronic record of the chain of custody of the drug from manufacturing to dispensing. The FDA has encouraged this method since 2005, following successful pilots by Johnson & Johnson, Pfizer, GlaxoSmithKline, and Purdue Pharma.xvii Although RFID technology has since been replaced by some of those original users for 2D barcodes and other serialization methods, many still argue that RFID is the right technology. No matter the method, pharmaceutical companies need to help ensure the appropriate software and scanners are used at each stage of the supply chain, from the manufacturers to the warehouse distributors to the dispensers.

Notably, the Federal Drug Supply Chain Security Act, enacted in November 2013, defined requirements for drug identification over a period of ten years. Although language has shifted to not specifically require a single technology, this legislation does require tracking methods for the entire Chain of Custody. As this becomes an industry standard for all pharmaceutical companies, a comprehensive approach and a single technological solution across the supply chain will be necessary.

Mitigation Strategies

Screening and Access Control
Access control and screenings are main components of managing risks. Leading practices for access control often include regular checkpoints throughout the facilities, which require positive identification checks of all employees, contractors and visitors at points of entry and secured areas. Employee access should only be provided to areas necessary to perform their specific duties. Visitor access should be closely monitored while on the premises as well, including photo identification checks upon arrival, escorts at all times, and a visible temporary ID.
Industry standards now require background checks and verifications on all employees. Regular checks should be conducted depending on the sensitivity of the position. With the increasing rise in cargo theft, background checks and verifications on contractors, especially transporters, is also considered a best practice. It is imperative that personnel meet all the qualifications to perform specific functions.

Federal regulation states any personnel involved in any handling of a drug product shall have education, training, and experience to enable that person to perform their assigned functions. Qualified individuals shall have training in current good manufacturing practices on a continuing basis and with sufficient frequency to assure employees remain familiar with current Good Manufacturing Practice (GMP) requirements applicable to them. Federal regulation does encompass contractors and consultants as well. Specifically, education, training, and experience is also required of consultants advising any aspect of the business and the facility shall maintain records stating the name, address, and qualifications of any consultants and the type of service they provide.

One of the main components of access control are badges, keycards or a similar type of ID to control entry to the premises and secured areas. Standard processes should not only be in place for the issuing of these badges following the verifications mentioned above, but also be in place to remove access and reclaim these badges prior to the departure of employees. All badge access must be documented and updated to maintain access control within the warehouse.

Although physical controls and ID checks are critical to the security of a warehouse, those controls are not always 100% effective. Thus, utilizing employees as the final stage of security within a facility can manage risks more effectively. Building a “See Something, Say Something” culture among employees not only can maintain better access control but also can provide employees with a sense of duty in the workplace. Training and awareness-building lay the groundwork for this type of campaign but a formal reporting procedure must also be in place. If an employee does see something suspicious or hazardous in the workplace, do they know who to tell? Do they know how to report it? Although responses can vary depending on the context, determining the chain of command and formalizing response plans are important steps to mobilize a “See Something, Say Something” culture.

Controlling access to data and information networks is another security factor becoming increasingly important in today’s pharmaceutical industry. Leading practices include secure firewalls, up-to-date virus software, and automated backups to maintain data security.

**Physical Considerations**
Several physical risk mitigation opportunities exist throughout the planning phase of a medical warehouse, which include but are not limited to location, physical building, lighting, security, power, and layout design.

**Location and Physical Building**
To begin, the physical location of the warehouse must be accessible to all health facilities with whom the medical warehouse works. Basic necessities, such as road access and the absence of a congested area are ideal when planning the physical location of a warehouse. In addition to location is the physical building. This involves meeting basic requirements such as having doors
wide enough to allow for the easy movement of products and equipment entering the building on a regular basis. In addition, the floors must be strong enough to meet the pressure from loaded racks within the warehouse. Considerations must also be made for how high the roof and ceiling should be, relative to the placement of rack configurations below. Lastly, windows may be used to increase ventilation, and should be placed to keep out insects and deter burglars.

Lighting
Vastly important is the exterior lighting of the warehouse. To minimize and control the outside perimeter, federal regulations require the premises be well-lit. Perimeter fencing of warehouse facilities should be used to deter unauthorized access to these facilities. Monitoring and surveillance in external and internal areas are key to deterring, detecting and disrupting risks to the operations of a warehouse. Alarm systems and video surveillance should be utilized on the premises to prevent access to storage facilities. Specifically, entry points, loading docks, and receiving docks for cargo should be closely monitored by CCTV at all times. Leading practices for gated entry points include locked gates, manned gates, or monitored gates at a minimum, with many commercial operations recommending a combination of all three. Fences, gates, and other barriers should undergo regular inspections for damage and vulnerabilities as part of risk assessment and mitigation checks.

Security
To secure the location further, loading docks should not allow for a space between the edge of the truck and the building because this has historically been a point where products are stolen or exchanged for counterfeit products. Interior barriers also play an important role. These types of barriers can keep hazardous and high value cargo in separate areas with additional controls to limit access. As an added benefit, these barriers can even be used for organizational purposes, to maintain distinct areas for domestic versus international cargo.

Power
Windows can be used to supply natural light during the day, which will assist in driving down energy costs. The organization should be particularly cognizant in its selection of light bulbs, as certain rays of light may harm certain products. Power is also an important element for any medical warehouse, especially as certain pharmaceuticals must be refrigerated at all times. If the warehouse loses power, a contingency plan must be in place to ensure these products remain refrigerated. Failure to do so could result in a significant loss of revenue for the organization. A power-outage contingency plan would likely include the use of generators, which must be regularly maintained to ensure they will run properly in the event of a power outage.
Layout Design
However, the most important factor in planning a warehouse is accounting for space and creating the overall layout design. The layout design process will result in decisions for how the space should be organized to enable efficient warehouse activities. This process involves the identification of specific warehouse activities. At a high level, typical warehouse activities include the receiving and storing of products, and the shipping of those products. Several elements should be considered when designing the warehouse’s layout, which include: truck docking, shipment receiving processes, shipment storage processes, shipment retrieval processes, and shipment delivery processes. The organization must thoroughly understand the products it handles and the processes for acquiring, storing, and eventually moving said products to create an efficiently functioning medical warehouse.

Safety

Risks to Manage
Fire
Warehouse operations presents numerous fire risks. After a fire has started, pharmaceuticals can act as fuel or spread hazardous chemicals throughout the facility.

Preventing fire damage starts with adequate management processes. All personnel should be trained on emergency procedures and principles to reduce the risk of fire. Periodic maintenance and housekeeping processes should focus on key fire risk areas. All electrical equipment should be appropriately maintained, never overloaded, always grounded, and regularly audited. Process material build up on materials handling equipment can introduce fire risks during operations. All maintenance processes for materials handling equipment should aim to minimize fire risk. General housekeeping can also help reduce fire risk, as excess debris can serve as a fuel source and impede fire suppression efforts.

Arson is a significant concern for warehouses full of flammable materials. Organizational security policies can reduce the risk of arson. Site fencing, locked gates, external lighting, CCTV systems, security patrols, and badge access reduce risk of arson related fires.

The design of the warehouse can reduce the impact of a fire. Long, narrow one-story buildings allow emergency personnel faster access to the isolated, impacted area. Once a fire has broken out, adequate warehouse ventilation reduces risk of smoke inhalation. There are economic tradeoffs for storage configurations of products. Narrow aisles, high product stacking, and solid shelving improve product velocity and storage efficiency but increase the risk of fire damage.

The most critical fire suppression asset in warehouses is the sprinkler. Sprinklers should adequately cover all areas of the warehouse. For warehouses with high storage racks, in-rack sprinklers can reach upper storage areas. Wet-piped sprinkler systems contain water under pressure that is ready for immediate discharge. Dry-piped systems should be avoided as the time required to fill the pipe with water increases risks of damage. In addition to sprinkler installation,
carbon dioxide fire extinguishers should be installed throughout the warehouse premises. Fire extinguishers allow on-site employees to quickly put out small fires before the fire spreads and the warehouse-wide sprinkler is triggered—causing further damage to stored products. Carbon dioxide fire extinguishers could potentially save the warehouse thousands of dollars if properly installed.

The layout of materials in the warehouse can significantly reduce fire risk. Fire boxes can be used to isolate flammable materials such as oxygen tanks. Warehouses frequently rely on rechargeable batteries or diesel fuel for materials handling equipment and forklifts. The refueling stations should be isolated from other areas of the warehouse by fire barrier walls. Aerosol drug delivery systems are an explosive risk in addition to a flammability risk and need a separate risk assessment.

Additionally the design of product can help reduce the spread and impact of fire.\textsuperscript{xxiv} Packing materials and pallets can fuel fires and efforts should be made to reduce the risk potential. Careless disposal of packing materials and pallets can lead to fires that spread to central warehouse areas.

The high density of product value in medical supply chains and the use of water as a fire suppressant can result in a significant economic loss for a warehouse. Based on quantitative analysis and taking into account costs, benefits, and uncertainties, additional measures might be justified to protect products. For example, encapsulated storage solutions shield product from water sprinkler damage.

When assessing the economic impact of a fire risk event, analysis should take into account the potential for lost revenue and business disruptions in addition to product loss. In fragile supply chains without sourcing redundancies, the loss of a single critical supply node (e.g. fire completely burns down a warehouse) can impact the entire product flow.

**Workplace Safety**
Provisions to safely and effectively manage a warehouse can conflict with shorter term goals of maximizing product velocity and storage efficiency. According to the Bureau of Labor Statistics, more than 5 annual injuries occur per 100 warehouse employees.\textsuperscript{xxv} Facilities with higher safety performance generally also have higher operational performance.\textsuperscript{xxvi} The fundamentals of disciplined adherence to efficient processes creates a culture supporting both safety and operational excellence.
A comprehensive safety program should include regular floor observations, full audits, and executive-level stewardship of safety metrics. Management commitment to safety must be well communicated through every level of the organization. A comprehensive safety program also needs an accident investigation and gap closure process. Contractors and visitors should also understand management’s commitment to ensuring a safe work environment.

All employees and visitors to the facility should be adequately trained for the scope of their activities. Good housekeeping practices, appropriate personal protective equipment (PPE), hazardous chemicals management, and emergency procedures are some of the topics that should be covered in training.

Certain medical products require temperature control throughout the supply chain. Dry ice is commonly used to maintain lower temperatures during transport. All packaging should be adequately labelled to inform handlers of the risk. Correct training and PPE helps to minimize the risk of frostbite, asphyxiation, and rapid kinetic discharge.

Materials handling equipment and forklifts present safety risks based on condition of the machinery or unsafe operational practices. All equipment operators need thorough training on safe operations including emergency shutdown procedures. Regular equipment maintenance can prevent potential accidents. All non-standard activities with equipment, including maintenance and repair, require electrical and mechanical lock-out tag-out procedures.

Slips, trips, and falls are common injuries in warehouse operations. Good housekeeping is critical to minimize these risks. Floors and aisles should be kept clear and clean. Internal lighting can also reduce risks across all warehouse operations.

Implementation of leading practices reduces the frequency of safety instances while improving operational performance. Leadership is critical to establishing a disciplined safety culture for an organization.

**Hazardous Materials**

Another concern in medical warehousing is the risk of employees working with and handling hazardous substances. Contact with certain pharmaceuticals may cause harm for employees working onsite; resulting in the ill health of employees, which may lead to employee absence due to illness or to litigation concerns from employees who feel unnecessarily exposed to hazardous materials. The concerns of employees and looking out for their safety concerns should be at the forefront of any medical warehousing strategy. As an employer, medical warehousing organizations need to conduct an extensive risk assessment of exposures to hazardous substances on site; leading practices to control employee exposure to hazardous material includes, but is not limited to:

- Elimination or substitution of the hazardous substance or process that generates the exposure.
- Reduction of the level of exposure through process changes or implementation of environmental and/or personal controls.
- Provide hazardous material training for targeted personnel.
- Create emergency procedures for isolation of hazardous materials.
Taking care of onsite employees is good business strategy. Employee retention improves with better working conditions, resulting in improved skill retention. The competitive advantage brought forth by skilled, trained workers is worth the investment. Satisfied employees are also more likely to perform at optimal efficiency. On the other hand, if employees believe they are unnecessarily exposed to hazardous materials, they are less likely to perform at optimal efficiency. If safety concerns are not addressed in the early stages of medical warehouse design, lingering safety issues may prove too disastrous to overcome in the long run.

**Mitigation Strategies**

**Emergency Preparedness**

Emergency preparedness depends on several aspects including the location of the warehouse and the procedures the facilities put in place. Pharmaceutical warehouse sites should be located in places which can minimize risks from natural hazards such as floods, landslides, earthquakes, hurricanes, and tornados. Federal regulations state all facilities must have a procedure to ensure they are prepared for and protect against any crisis that may affect the safety, security, or operations of the facility. These procedures shall be in place in the event of strike, fire, flood, or other natural disaster, or other situations of local, state, or national emergency.

The safety and security of the products stored on site depend on minimizing flood risks due to unpredictable weather and zoning. To protect the pharmaceutical product, warehouses should preferably not be built on a flood plain or close to a coastline susceptible to inundation during storm surges. If the warehouse is built under these conditions the floor of the warehouse must be raised well above the predicted 100 year flood line, or the site must be fully protected by flood defenses such as bunding or drainage swales.

Other natural disasters include earthquakes, volcanic eruptions and tidal waves depending on geography. Warehouses can and should be engineered to help withstand these natural disasters. Preparing in advance for these disasters by choosing the best location, building in preparation for natural disasters, and having procedures that allow for the correct actions to maximize safety and security and minimize risks.xxviii

**Housekeeping Practices**

One of the key components to mitigating accidents and fire risks is ongoing housekeeping operations. Effective housekeeping operations do not solely include cleanliness, but also include orderly work areas, floors free of slip and trip hazards, and the removing of waste materials. Layout design, signage, storage facilities and maintenance all play a role in housekeeping operations from the construction of the warehouse to its day-to-day operations.xxx

Many of these operations should be conducted on a daily basis, along with routine audits to ensure housekeeping is adequately maintained. The table below lists many important components to maintaining appropriate housekeeping standards.xxx

<p>| Staging Area | Empty pallets stored in designated area and lying flat. | Doors are closed when not in use. | Forklifts parked away from traffic flow with keys removed and forks lowered. | Emergency stop buttons visible and accessible if applicable. |</p>
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bulk Store</strong></td>
<td>All components/products appropriately labeled and stored in allocated areas.</td>
</tr>
<tr>
<td><strong>Flammable Goods Store</strong></td>
<td>Store is locked when not in use. Area used for storage of flammable goods only.</td>
</tr>
<tr>
<td></td>
<td>Isopropyl Alcohol (IPA) bottles stored with current labeling and within expiry date.</td>
</tr>
<tr>
<td></td>
<td>All reject stock placed in correct storage location.</td>
</tr>
<tr>
<td><strong>Floors</strong></td>
<td>Floor is free of equipment not in use. Floors are cleaned of excess dust.</td>
</tr>
<tr>
<td></td>
<td>Floors are clear of spills, chemical residue.</td>
</tr>
<tr>
<td></td>
<td>Ground is free of waste in all areas.</td>
</tr>
<tr>
<td><strong>Waste Management</strong></td>
<td>Waste bins are not overflowing. Waste bins are used for appropriate materials.</td>
</tr>
<tr>
<td></td>
<td>Waste is in correct disposal area. Hazardous waste is correctly labeled and segregated.</td>
</tr>
<tr>
<td></td>
<td>Safety equipment is worn for hazardous waste disposal.</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>All fire/emergency exits and stairs are clear. Safety signs are clearly visible. Access paths are unimpeded. Fire extinguishers are visible, accessible, and working.</td>
</tr>
</tbody>
</table>
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