

CONCEPT OF OPERATIONS AND IMPLEMENTATION PLAN FOR INDUSTRY INTEGRATED LOGISTICS SYSTEM (I²LS)

Lt Col James A. Boyd, USAFR

A new approach to the logistics of acquisition combines elements of military and corporate strategies, which would allow the Department of Defense to take links out of the supply chain and radically streamline the system. The result will be a dramatic decrease in both logistics response time and materiel cost.

Shortly after the bombing of Pearl Harbor, the Japanese captured Hong Kong, French Indochina, Malaya, Burma, Thailand, and the Dutch East Indies. During the early stages of World War II in the Pacific, Japan systematically took control of islands throughout the region. Their reach extended to New Guinea and the Solomon Islands to the south, and two islands in the Aleutian chain to the north. For the Allies to conquer the Japanese, it would be necessary to either invade Japan or force the Japanese to surrender. The Japanese, however, were well protected by over 3,000 miles of ocean containing hundreds of fortified atolls. To maintain their foothold, the Japanese had developed a serpentine logistics chain stretching across the Pacific, that

moved supplies systematically from one island to the next.

General Douglas MacArthur, as Supreme Allied Commander, realized that it was not necessary to take back every island along the route leading to Japan. Instead he employed a “leapfrog” strategy, where he simply bypassed strongly held islands in favor of weaker ones further up the logistics chain. Once the stronger islands were cut off from their source of supply, the occupying Japanese soldiers were forced to retreat.

Much like the Japanese World War II logistics system in World War II, the process for our logistics system is a serpentine chain of warehouses and transportation channels linking our manufacturers to our fighting forces. As supplies move

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 1998		2. REPORT TYPE		3. DATES COVERED 00-00-1998 to 00-00-1998	
4. TITLE AND SUBTITLE Concept of Operations and Implementation Plan for Industry Integrated Logistics System (I2LS)				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Aerospace Fuels Management Directorate,Kelly AFB,TX,78241				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Acquisition Review Quarterly, Summer 1998					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 26	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

through this chain, each point along the way adds time and costs. This system was the same one used in the private sector to move consumer goods from manufacturers to the public. In the late 1960s, Sam Walton of Wal-Mart stores realized that by cutting links out of the chain (and allowing goods to “leapfrog” from the manufacturer directly to his stores), he could save both delivery time and product cost. The concept presented here details how the Department of Defense (DoD) can take links out of the supply chain to radically streamline its logistics system. The result will be a dramatic decrease in both logistics response time and materiel cost.

CONCEPT BACKGROUND

While commander of the Defense Contract Management Command (DCMC) at the Stewart and Stevenson plant in Sealy, TX, LTC Paul Dronka recognized a need for a modernized parts system to support the Army’s new family of medium tactical vehicles (MTVs). Dronka initiated an Army Reserve project to study modern systems used in private industry and to develop a new system to be considered for MTV parts support. I was tasked for this project, and was sent to study manufacturing operations at Lockheed’s Fort Worth F-16 Fighter airplane plant and at

Bell Helicopter’s facility in Dallas. After Dronka’s reassignment in July 1997, his replacement, LTC August Mancuso III, embraced the project and lent additional years of experience as an infantryman, tactical logistician, and contracting officer.

The resulting concept incorporates state-of-the-art methods into a distribution system based upon “best commercial practices” rather than the traditional “demand-level based” military supply system. The discussion below shows how the new system can operate.

THE CONTRACTOR-MANAGED PARTS PROCESS

This distribution system constitutes a paradigm shift from the traditional depot parts support process. Whereas the depots depend upon warehousing and stockage based on demand levels, the new process (the contractor-managed parts process) relies upon best commercial practices. Here I’ll provide an overview of the new concept; the details will be presented in a Concept of Operations at a later date.

BACKGROUND

The DCMC Stewart and Stevenson—Sealy has contract administration responsibilities for the Army’s new-generation family of medium tactical vehicles (FMTV). The DCMC recognized a need

James A. Boyd, an Air Force Reserve lieutenant colonel, is a manager for the Directorate of Aerospace Fuels Management, Kelly Air Force Base, TX. He holds B.S. and M.S. degrees. He is an Air Force logistics career program manager. His logistics experience obtaining vehicle parts as a vehicle maintenance officer at Elison Air Force Base, AK, was critical in writing this article.

for follow-on parts support, and the proposed process was to consider current practices and best commercial practices, as well as “state-of-the-art” systems under development. The DCMC funded a 1-week reserve active duty tour to Lockheed in Fort Worth, TX, and to Bell Helicopter in Dallas, TX. Many of the ideas came from those facilities, but the proposed concept is a unique approach to methods currently used by the DoD.

PROCESS

The unit material management activity (MMA) identifies a part or assembly needed and places a “fill or kill” requisition into the military supply system. If the request cannot be filled by the MMA (containing emergency essential and fast moving items), the MMA then calls customer support centers (CSC) of applicable contract parts depots (a number of contractors could be involved). If the item is to be deployed to a theater of operations, the request is directed to the Defense Logistics Agency (DLA) as is currently done.

Contract parts depots operate under “requirements” contracts that specify terms and conditions of sales. The MMA can choose among the authorized sources for the fastest and most economical response.

Components are shipped by the appropriate mode (depending on priority) from the contractor directly to the MMA. Cost of components plus a prenegotiated surcharge are billed against the MMA’s impact account. Defense Finance and Accounting System pays the banking institution once a month. The MMA verifies purchases from shipping invoices and monthly itemized charge bills.

The contractor uses “state-of-the-art” inventory management systems such as

manufacturing resource planning (MRP), COOP, and ERP (both commercial software packages). MRP and ERP track components at every step in the manufacturing process (inbound shipping status, projected assembly line need dates, status of components pending assembly line use, work-in-process, and components on hand). COOP is similar to MRP systems except that it’s mainly a warehouse item tracking system. Through software such as MRP, contractors know what is on hand (and where), what is inbound from subcontractors, and if an item can be pulled from the manufacturing process without delaying production. Contractors also have the ability to use the capacity of their vendors to supplement their own. For example, a diesel engine manufacturer who supplies the

“Contractors also have the ability to use the capacity of their vendors to supplement their own. ”

primary contractor may agree to ship an engine within 48 hours after one has been requested. The engine manufacturer would always have an engine in stock to meet this requirement. It would not be a problem for several thousand manufacturers (subcontractors) to keep an inventory of the items they make on hand; most normally have a stock of items on hand that are waiting to be sold. However, for the government to keep the same items on hand would require a huge investment in inventory, facilities, and a system to distribute the items.

Funding. Each MMA that supports and maintains the FMTV would use a special “impact card” account for this purpose (through a national banking institution).

The impact account would be funded from the unit's operation and maintenance funds. Local commanders should determine the dollar limitation (if any) to place on the account. (DLA imposes a \$25,000 transaction limit on their accounts; NASA allows up to \$100,000.)

CONCLUSION

Modern civilian manufacturing and distribution systems have reduced delivery response times from weeks to just a few days (or overnight). Taking advantage of these efficient systems will greatly improve component availability while reduc-

"Modern civilian manufacturing and distribution systems have reduced delivery response times from weeks to just a few days (or overnight)."

ing the inventory and costs of existing government depot operations. The government should adopt a contractor-managed parts process to stream-

line the traditional depot system, where it is advantageous to do so.

CONCEPT OF OPERATIONS

HISTORY OF THE TRADITIONAL SUPPLY PROCESS

At the onset of World War II, massive quantities of military equipment and supplies were manufactured for the American fighting forces. As new tanks, ships, and airplanes reached foreign soil, it became clear early on that a system of support was needed to identify and distribute supplies to those distant battlefronts. A team of hand-picked men, led by Col Tex

Thornton of the U.S. Army Air Corps, was sent to Harvard University to learn statistical techniques. Their role during the war was to collect and analyze data on such things as aircraft on hand, aircraft operational, supplies on hand, and numbers of able-bodied personnel. This select handful of men known as the Army Air Corps—Statistical Control determined the logistical needs of the fighting forces. Their work allowed planners to know on any given day what was needed and where.

At the war's conclusion, Thornton and his team were released from the military back into civilian life. Thornton assembled a team composed of himself and nine others who had been part of "Statistical Control." Through Thornton's efforts, this team was hired by Henry Ford II in November 1945 to work as Henry's personal assistants. Within the Ford hierarchy, this group became known as the "Whiz Kids." A year later Thornton, who had been too ambitious in his attempt to become president of Ford Motor Company, was fired by Ford and went to California to strike out on his own. After several years building the Hughes Aircraft Company into an industrial giant from its meager beginnings as a hobby of Howard Hughes, Thornton bought a little family-owned company that made microwave ovens: Litton Industries. Litton, with Thornton as chairman, also grew to become an aerospace giant. Thornton is best remembered as the father of the conglomerate movement of the 1960s.

The members of Statistical Control remaining with Ford instituted the same quantitative techniques they had introduced to the Army Air Corps. The emphasis at Ford then moved from quality to efficiency; a system that nearly destroyed the business

in the 1980s after high-quality Japanese automobiles appeared in the marketplace. Of those Whiz Kids remaining with Ford, the most famous was Robert McNamara, who after just being named as the new president of Ford Motor Company in the early 1960s, was recruited by President John H. Kennedy as Secretary of Defense. McNamara brought the same quantitative approaches to his management of the DoD that he had imposed upon Ford Motor Company. His tenure lasted through the early years of the Vietnam conflict, but the effects of his philosophies can still be seen in our present-day system of supply. Although new weapons systems have been introduced, and some streamlining of supply channels has occurred, the process remains basically the same as it was during the Vietnam era.

THE TIERED REPLENISHMENT PROCESS

Below are attributes of the supply process that supports military series vehicles.

- At maintenance activities, mechanics investigate malfunctions reported by the operators. Once they have itemized on the work order all of the components needed to place the vehicle back in service, the list is forwarded to Materiel Control.
- A materiel control specialist researches the parts identified by the mechanic, and determines whether or not the item is centrally managed by a depot. Depot managed parts are assigned federal stock numbers while commercial parts (for commercial off-the-shelf vehicles) use manufacturer part numbers. If the item is centrally managed, as is the case with military series vehicles, the

materiel control specialist would submit a request into the supply system computer. In the meantime, the vehicle awaiting repairs would be stored in its dismantled state until the required components arrive.

- When the materiel control specialist placed the order into the supply system, the computer registered a “demand.” After a certain number of demands occur within a specific period of time, the computer flags the item for a stockage level in the local warehouse. The more demands that occur, the higher the level of stockage. The repair shop can also request that a special level of stock be maintained for selected parts, even though the demand for the items may not be sufficient for automatic stockage based on consumption.
- If the part requested by the MMA is physically on hand in the local warehouse, the supply system computer locates the part and fills the request. If the part is not on hand, then the request is forwarded to the supply depot.
- The supply depots currently have a variety of functions:
 - First, each item procured is assigned a federal stock number and placed under the responsibility of an item manager. The item manager uses consumption estimates from the supply system to predict what the annual numbers of an item would be.
 - Then the item managers’ estimates are used to plan the Industrial Stock Fund budget. The stock fund is a revolving account that is used initially to

purchase inventory. Once sold to the end user, the stock fund is reimbursed from unit operation and maintenance funds.

Next, contracting officers use the item managers' numbers to solicit bids from potential contractors and to eventually purchase the items for stockage in the warehouse. Products in the depot flow to local supply warehouses for either inventory or to meet an immediate need.

When a manufacturer enters the government contracting arena, the effects can be profound. Take, for example, a family-owned company that manufactures lawn mower air filters. The owner of the company decides to bid on a contract to supply air filters for M-Series trucks. The solicitation would require the manufacturer to make

"When a manufacturer enters the government contracting arena, the effects can be profound."

deliveries over the next year of 100,000 truck filters, with the first delivery of 10,000 filters required within

the first 90 days. To meet the demands of the contract, the small company must hire 30 additional people, buy several new machines, and add space to the facilities to accommodate the additions. Since the contract is only for 1 year, the risks are high that there would be no follow-on contracts. Therefore, the owner must include ramp-up costs in the bid. If the company does not get the follow-on business, the extra people (who were initially untrained but, over time, became productive employees) must be let go. The new equipment could be sold at a heavy discount or retained for

possible future work. Unless the additional facilities were rented, the costs of the additions must be absorbed along with the usage costs of the equipment and training costs of personnel. These costs must be included in the costs of the parts sold to the government.

As units are manufactured and shipped to the depot, the depot fills its bins with the huge quantities it needs to supply all its military customers. Then as the customers order the components, the depot must process the orders, handle the stock, and ship to the requesters. Until the stock is purchased, the depot has its stock fund tied up in inventory. The stock fund has a dollar ceiling, so it is possible not everything needed can be purchased at one time. Limitations must be placed on stockage levels (for example, the inventory might be held at 90 percent of the established requirement). For this system to work, the government must maintain a large inventory and must operate a distribution system that spans the globe.

THE MODERNIZED DISTRIBUTION SYSTEM: INDUSTRY INTEGRATED LOGISTICS

THE PARADIGM SHIFT: WAREHOUSE OR DEMAND-BASED CONCEPT TO BEST COMMERCIAL PRACTICES

Up until the early 1960s, products moved from the manufacturers through a system of brokers, jobbers, wholesalers, and retailers. The typical manufacturer was one that made most or all of the products sold. Manufacturers used a system known as vertical integration. For example, a company that made ketchup would make the product, but might also

own the tomato farm, the tomato packing plant, trucks to move the tomatoes to the ketchup plant, a bottle plant that made the glass bottles, a label printing operation, and another trucking operation to move the product to customer's warehouses. In recent years, companies have found they can save by outsourcing operations they once had integrated into their own operations. The same manufacturer of ketchup today would use contract growers to provide the tomatoes, contract carriers to move both the raw ingredients and the finished product, a printer for the labels, a plastics company to supply the bottles and a twist-off plastic cap, and finally, another manufacturer to actually make the ketchup and fills the bottles. The ketchup company can virtually outsource every aspect of its operation to the point that it makes nothing in-house; it only coordinates manufacturing activities and sells its products.

The distribution of products has followed a similar genesis. It's no longer necessary to own a fleet of trucks nor is it necessary to deal with a chain of middlemen. Sam Walton, founder of Wal-Mart Stores, found that by dealing directly with the manufacturers and eliminating the middlemen, the products could be moved much quicker and at discount prices. The advent of trucking deregulation has encouraged whole new transportation industries. Today Federal Express, United Parcel Service, and others can move products from the manufacturer to the customer in a fraction of the time involved in the DoD system. With today's technology and infrastructure, products can (and do) move from an outsourced manufacturer directly to the end user without ever appearing on a store shelf (and if need be, over-

night). The concept of operations proposed here capitalizes on today's technology and commercial infrastructure to move military materiel from the manufacturer directly to the end user.

THE INDUSTRY INTEGRATED LOGISTICS CONCEPT

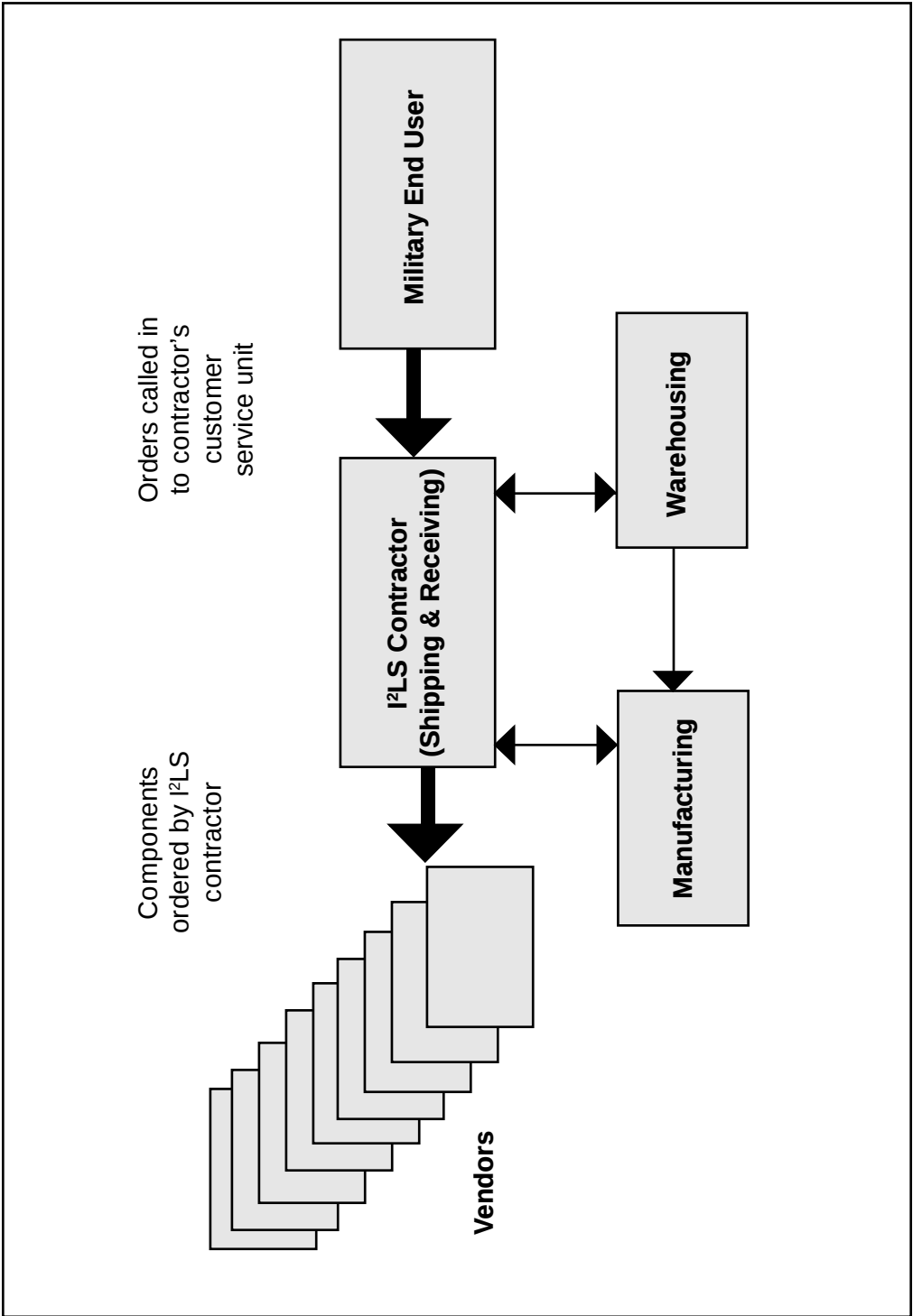
Under the new concept, the military depot could continue to procure, store, and distribute materiel that would not be advantageous for contractors to handle. However under the proposed concept, most items presently managed by military depots would be very appropriate for the industry integrated logistics (I²L) concept.

The role envisioned for the depot would change from active retail operations to a role of managing

war reserve materiel. Although this might involve warehousing of certain critical items, even war reserves can be held (and later distributed) by contractors. The depot's role change then would be toward contract management of war reserve materiel. The depot responsibilities that would decrease at the onset of moving to industry logistics would be for major defense systems in the production stage (such as military vehicles, aircraft, and armament systems).

The program manager would solicit a prime I²L system (I²LS) contractor for logistics support. A contractor of a major defense system would be a logical candidate for the logistics support of that system. This contractor could easily integrate

"In recent years, companies have found they can save by outsourcing operations they once had integrated into their own operations."



I²LS Flow Diagram for Requisitions

the flow of replacement components into their existing timed delivery system. The multiyear contract (see specifics in the implementation plan) would require the contractor to provide a specified level of service. The level of service would correspond to performance factors such as fill rates or operational availability over a specified period. The contract would not specify stockage levels. Instead, the contractor would be responsible for setting up a system that met the performance demands of the contract. If war reserve stockage is needed, the contract would specify items that must be shipped within 24 hours of notification. Meeting this time constraint might require the contractor to maintain these items on stock. The choice on stocking level decisions remains with the contractor. However, the government could test the system from time to time to verify contractor performance. At post-production of a system, there obviously would no longer be timed delivery to support the prime contractor's manufacturing operation of that system. When post-production occurs, a follow-on contractor must continue these responsibilities.

Stock number identification of components in I²LS would not be needed. Instead, all items would be identified by manufacturer part number (probably with a stock class prefix). The prime contractor would publish an itemized list of components, with each item having a prenegotiated price. Price changes would be coordinated through the program office. The contract would allow an added surcharge for each item purchased by the customer. A reduction in the surcharge would be assessed for performance below the acceptable level (default would occur at a specified level of unacceptable performance).

The distribution system employed by the contractor would not be specified by the government, but would be determined by the contractor. The contract would also specify the performance reporting requirements of the contractor.

All items purchased through the contractor's system would be paid from operation and maintenance funds. Every activity involved would be issued an impact account funded from their funds. An MMA or supply activity would have a designated account custodian who would be responsible for controlling the purchases and verifying that

"The distribution system employed by the contractor would not be specified by the government, but would be determined by the contractor."

purchases were received. Instead of inputting a requirement into the MILSTAMP (military standard transportation and movement procedures) and MILSTRIP (military standard requisitioning and issue procedures), requests would go directly to the applicable contract source. The contract source would then direct ship the materiel to the requesting end user. This is known as direct vendor delivery.

When a maintenance activity needed an I²LS component, they would request the item by manufacturer's part number through their MMA. If the item were on hand, the MMA would release the item to the maintenance activity. If the item was not on hand, the MMA would order the part directly from the contractor-operated depot, citing the maintenance activity's operation and maintenance funds. The local supply system has the opportunity

to capture the demand data for local inventory management purposes. The MMA would then contact the customer support centers of the prime parts vendor and request delivery of the part. Orders would be placed by telephone followed by a faxed hard-copy of the order. The contractor could also provide direct computer access to their ordering system.

THE CONTRACTOR-MANAGED COMPONENT SYSTEM

The process described here is a template for a contractor-managed component system. This approach, if implemented by a contractor, would provide a high delivery rate at a cost much lower than that currently used by the DoD-managed system.

The contractor-managed organization. The organization should consist of a chief executive officer (with administrative staff), a customer support center, and component shipping and storage facilities.

"The [customer service center] has no geographic limitations; it can be located anywhere that is accessible by telephone communications."

This, in itself, is not unique. What makes the concept different is the functions performed by the CSC, and the use of state-of-the-art item tracking systems. The CSC

is the lead business activity of the organization. Through the CSC, sales are generated, customers are helped, and account billing occurs. But most important, the CSC tracks and coordinates items shipped directly from vendors to the ultimate customer. The component shipping and storage facility handles and stores a limited number of items that

customers might need faster than the system can otherwise provide and for components intended for sale in the same geographic area.

The customer service center. The CSC has no geographic limitations; it can be located anywhere that is accessible by telephone communications. Through its streamlined structure, it can operate with as few as 10 employees for each \$2 million in gross sales. The CSC is the business development arm of the system, and is the nerve center for all component sales. The types of people needed by the CSC would be a single operations officer, customer liaison representatives, component research specialists, commercial account representatives, government account representatives, and account paying, billing, and collecting.

Account representatives would actively solicit business for both commercial and government activities. These members have both sales and contracting skills but would refer proposals through legal counsel (although legal counsel need not be part of the staff). For government business, a single contract for each agency (e.g., DoD, Department of Energy, Department of Agriculture) would define terms and conditions; for commercial business, an agreement spelling out terms and conditions of sales would be used. The terms and conditions for both government and commercial customers would be similar. Differences would be in the unique requirements of each of those business segments. It is the primary function of the account representative to generate new accounts and service existing ones.

Customer service representatives would be the point of sale for the organization. Customer service representatives would

take orders, then create the computerized order record, request availability of items from the research specialists, advise the customer of the availability of the items (within 2 or fewer hours), and finally, confirm the order with the customer. With computerized ordering and with outsourcing, limiting the number of items on an order to “one” eliminates the need for consolidation of an order before final shipment (as is the case with traditional systems, where many items might be on a single invoice). Items could instead be shipped directly from off-site vendors to the customer, with only information and money changing hands. Any consolidation of shipments would be handled by the responsible vendor’s shipping department. (It also would be possible for the shipping vendor to include the primary vendor’s invoice and label with the shipment.) Wartime requirements could still be processed through this system. In the case of the Army, the MMA would assume responsibility for consolidating materiel and getting it moved into remote wartime theaters of operation. For the Air Force, property would be consolidated at a central receiving area and moved by aircraft into the theater of operations. The priority freight carriers would deliver to the entry point for the wartime logistics systems. It is essential that wartime logistics systems be maintained during peacetime. Those systems can be adapted to take advantage of the I²LS interfaces.

The research specialists would receive new computer records generated by the customer service representatives, then query the resource tracking system to locate the items and establish estimated delivery times. The CSC would check

availability of an item from possible sources in the following order:

- at company-owned warehouses (preferably one closest to the customer);
- in the MRP II system for components held in the production plant component staging area awaiting movement to a work station (if the production schedule permits); and
- from vendor sources.

Once a customer service representative has confirmed an order based on the research specialists’ estimated delivery time, the order is marked for fill and the computer system

sends fill notices (with requested delivery dates) to each source indicated by the order. The es-

“Customer service representatives would be the point of sale for the organization.”

established estimated delivery time is based on times established either contractually or (if not otherwise spelled out) by the best judgment of the research specialist. The delivery date specified to the customer becomes a “not later than” date, and performance of the CSC is measured against its ability to meet those dates.

Account representatives have access to the computer records for their accounts, and receive continual updates on the status of orders outstanding. It is the responsibility of account representatives to monitor actively the status of orders outstanding and facilitate deliveries to the customers. When there is a problem, the account representative works on the

customer's behalf to resolve it. If an order does not meet the established delivery date, the account representative must work out an acceptable solution for the customer. The account representative re-

"The CSC could act as purchasing agent for the manufacturing arm of the parent company for all items purchased for the assembly line."

ceives the notice from the source when an item has been shipped and receives notice when the item reaches the customer. It is the account repre-

sentative's final duty to confirm with the customer that the item was, in fact, received. At that point, the invoice is marked in the system as complete. The order then becomes available for billing. The account representatives are graded on the "dollar" value of invoices released for billing, and average age of invoices released for billing.

The accounting group oversees payments to the company's vendors, and billing and collections from customers. The computer system performs account consolidations, then bills the appropriate accounts and establishes an accounts receivable record, or establishes an accounts payable record (in the case of company purchases from vendors). The majority of the accounts receivable are billed and paid through major credit cards. The customer receives an itemized bill from the credit card company and verifies the purchases by comparing the reference numbers on the bill to the actual invoice shipped with the component. This group is graded on "dollars" collected and vendor payments made on time.

The CSC establishes agreements with sources of supply worldwide. The

agreements specify such things as expected level of quality, delivery time requirements, computer system interfaces, and billing arrangements. The CSC has no responsibilities for warehousing, shipping, or receiving of the physical products. These functions are performed by the vendors and by the storage and shipping activity (for those items on hand in that facility). The CSC could act as purchasing agent for the manufacturing arm of the parent company for all items purchased for the assembly line.

The storage and shipping activity. This activity's primary purpose is to receive and store components: intended for the production line, for components specified by a customer for emergency on-hand items, and for those items that must be on hand to meet contractual delivery schedules (e.g., items that have too long a lead time from vendor sources to meet contractual delivery dates).

The warehouse receiving function processes all items delivered to them. The items are entered into inventory by scanning bar code labels on the containers and physically placing the items in designated bin locations. The items reside in their bin location until needed. The computer system notifies warehousemen when it's time to pull an item and move it to another location. As an item moves through the shipping activity, the package's bar code label is scanned at each work station. If the item is for a priority, the item is immediately marked as such when it is pulled. The item is then prepared for shipping (or delivery to the manufacturing staging area) ahead of lower priority items. Two preparation areas exist: one for domestic shipments and one for foreign. While an item is being prepared for shipment, the appropriate

shipping office (foreign or domestic) prepares the shipping order with the appropriate shipping class and carrier for the priority. If other lower priority items are scheduled for the same location, those items are included in the shipment and shipped with the priority item (provided this action does not delay shipment of the priority item). The stockage level of items also held for emergency purposes (such as war reserves) would never be reduced below the emergency level (unless needed for a contingency). As production stock is received, items identified as war reserve would be removed on a first-in, first-out basis. This would ensure that the on-hand inventory is always the most recent version used in production. The CSC has visibility into components located both in the warehouse and on the production line (likewise, the production line has visibility into the warehouse's inventory, and the availability of components from vendors with outsourcing agreements). This is possible because of an integrated resource planning software system such as MRP II.

Contract vendors. Every component that is outsourced can be delivered to end users directly from vendors who are under agreements to perform within specified times. The CSC would establish agreements with these vendors, specifying how rapidly an item might be shipped and where it would be shipped. The vendor isn't told how much and what to maintain in inventory. The vendor is only responsible for meeting the delivery times, even though this may require the vendor to keep some items available on the shelf. It is reasonable to expect a manufacturer to have a certain quantity of finished products on-hand that have not been sold (except for custom items).

Regardless of whether an item is a custom item or something in widespread use, the vendor decides whether to store an item or risk a monetary penalty for missing a delivery time.

Because the CSC can count an individual line item as an order, every vendor involved can ship directly to the end-user. This eliminates the need to physically consolidate an order at the CSC for items coming from multiple subcontractors, saves excess shipping costs, and dramatically shortens the shipping time. This makes sense when one considers the number of items involved in a single major system (a typical automobile has more than 14,000 line items); and what is involved in a depot system in both cost of inventory and warehouse space to keep all the potential items needed on hand. We can invest in an expensive inventory that takes up a lot of warehouse space, or, since these items are commercial off-the-shelf, we could expect some of these items to routinely be on hand at the respective manufacturers. They are already storing the items. If

"Every component that is outsourced can be delivered to end users directly from vendors who are under agreements to perform within specified times."

delivery can be made in just a few days through express shipping methods, we can eliminate the need to buy any of the items until they are needed. This also eliminates inventory that is bought but may never be needed. In the meantime, the CSC tracks the items and ensures the customers get their components as ordered.

Vision for a new system. Modern commercial distribution systems can allow

DoD to outsource component replenishment for many current programs. The contract envisioned for a contractor-managed parts replenishment system rewards the contractor for meeting a high percentage of demands, but incrementally reduces the contractor's fee at lower levels of performance. Success of this concept depends on the contractor's ability to meet the delivery schedule—a tasking that can be accomplished only through:

- modern inventory control software;
- bar code tracking of inventory;
- express shipping; and
- delivery agreements between the prime contractor and its vendors.

Since this concept takes advantage of streamlined delivery techniques, a large investment in facilities and inventory by DoD is no longer necessary.

IMPLEMENTATION PLAN

An implementation plan should be developed jointly among the government agencies involved, and the contractor. The plan should describe the process to be implemented and a schedule for implementation. At a minimum, the plan should

cover the events and times to transition from the traditional depot supply system to the contractor-managed concept. It should cover these areas:

- identification of key decision-makers;
- responsibilities;
- contractual arrangements;
- resources required;
- changes needed to current policies and procedures;
- a schedule of events; and
- a plan of operation after implementation.

The concept of operations should be used as a guide to develop both the implementation plan and the plan of operation. The concept of operation describes “why and what” should be done, the implementation plan describes “how and when” to begin, and the plan of operations describes “how and what” should be done to operate the program. The contractual arrangement between the government and the contractor should reflect the concept to be employed in the process. The following sample contract contains some of the clauses that could be used for this agreement.

SAMPLE CONTRACT CLAUSES

SAMPLE COVER SHEET

Plant/shipping location: _____

Inspection office: _____

Any reference to _____ (Contractor _____ cited as _____).

This is a requirements contract effective from _____ through _____
{3 years}.

The Government has the option to extend the terms of the contract for an additional two years to be exercised in 12-month periods. Notice of intent to exercise the option must be furnished to the contractor 60 days prior to expiration of the contract.

Additive CLIN 9905 establishes a financial account for transportation costs, markup for inventory management, and storage and handling cost, which are reimbursible and will be shown as a separate item on the invoice.

Each customer will certify and validate _____ invoices within two working days after receipt and then forward to DFAS-CO for payment.

The procuring contracting officer for this corporate contract is _____
at (XXX) XXX-XXXX.

All orders WILL be shipped and packaged IAW best commercial practices.

Routine requirements will be shipped in eight calendar days ARO, if in inventory and will be shipped via the least costly mode.

NMCs or AOGs (aircraft on ground) (identified by three digits as 999, N–and E–) will be shipped in 48 hours ARO if in inventory. NM

+Cs (AOGs) are not currently identified on electronic data interchange (EDI) orders. _____ will receive a telephone call from the cognizant emergency supply operations center (ESOC) or a fax from each cognizant inventory control point (ICP) to identify when an NMCs (AOGs) order has been sent. NMCs (AOGs) requirements will be shipped via fastest commercial mode.

The 24-hour number (voice mail after normal business hours) for NMCs (AOGs) is _____ and the fax number is _____.

Foreign military sales (FMS) requirements will be handled by faxed transmission from each center and will be shipped by the same mode as routine and NMCs (AOGs) requirements depending on the priority.

DCMC has agreed to monitor shipping on a spot-check basis.

The following clauses are deleted from this contract:

52.215-22	252.215-7000	252.227-7029	252.227-7019
52.215-23	52.215-9G01	252.227-7031	52.230-2
52.215-24	252.227-7013	252.227-7036	52.230-3
52.215-25	252.227-701B	252.227-7037	52.230-5
52.215-30			

Clause 52.210-9G33 (proof of principle [POPs—computer compatibility]) is updated to read 90 days in lieu of 60 days.

Clause 52.229-3 federal, state, and local taxes is deleted. _____ letter, dated XX XXX XX, containing their representation relative to the inapplicability of FAR clause 52.229-3, as well as FAR clause 52.229-4, is incorporated by reference in this award.

A maximum electronic delivery order limitation of \$25,000.00 is made a part of this contract.

Inventory transfer and EDI turn on will be as follows:
{time schedule for critical events}

DGSC will provide written authorization to the DCMC for a blanket modification to change the ship to location from a DLA depot to “XXX” {contractor}, {state} on existing due-in for part numbers included in the corporate contract after the inventory transfer has begun.

ICP’s POC for EDI is as follows:

Each ICP’s POC for the financial transactions is as follows:

Each ICP’s POC for the materiel management transactions is as follows:

Unit prices for NSNs referenced in this contract as “TBSP” (to be separately priced) will be added by contract modification once _____ has developed a unit price and DPRO had approved the item for inclusion in the military spares price list.

Customer returns will go directly back to the contractor. Contractor will recognize a return policy based on best commercial practices.

Comprehensive subcontracting plan is made a physical and material part of this contract.

The contract data requirements list and the special contract requirements to include materiel management reports and financial transactions reports are made a material

52. 216-9G16

Corporate Contract—Fill Rate

(a) *Definitions. As used in this Clause:*

“Fill rate” means the percentage of the total quantity of the items ordered which are shipped within 8 calendar days of receipt of order. For example, if 10 orders of 10 each are received and 8 shipments of 10 each and 1 shipment of 5 each are made in response to nine of the orders, a fill rate of 85% has been obtained. The fill rate achieved during each semiannual period will be used to set the authorized markup for the following period.

“Receipt of the order” means the date on which the electronic transmission of the requisition/delivery order is made from the Inventory Control Point (ICP) to the contractor. Requisitions will be issued for DLA-owned stock. Delivery orders will be issued for new material.

“Shipment” means the date on which the item is delivered by the contractor to the designated carrier.

(b) *The contractor agrees to provide a fill rate of 90% for the items included on this contract. If the agreed upon fill rate of 90% is achieved, the markup to the Military Spares Price List unit price which the contractor is authorized to charge is {100% of authorized markup}. If a fill rate lower than 90% but greater than or equal to 87% is realized, the authorized markup is reduced {to 92% of authorized markup} If a fill rate less than 87% but greater than or equal to 81% is realized, the authorized markup is reduced {to 80% of authorized markup}. A fill rate of less than 81% is determined to be an unacceptable level of performance. If the calculated fill rate is less than 81% for two successive contract periods, the Government may terminate the contract for default; however, if the contract is not terminated, the authorized markup for a fill rate less than 81% is reduced {to 68% of authorized markup}.*

(c) *Items for which orders are received in the first 6-month period that cannot be filled for any of the following reasons will not be used in the Fill Rate calculation:*

—*No Government stock transferred and lead time to obtain stock is greater than the time between inclusion of the item on the contract (i.e., contract award or contract modification) and the time in which the item would normally be included in the fill rate calculation for the next contract period.*

—*Government Due In not received by the contractor.*

—Contractor receives order(s) for quantities greater than the Government-provided annual demand estimate.

(d) The fill rate will be calculated semiannually on a cumulative basis for all orders received in the semiannual contract period. In order to avoid administrative problems, the period of time used to calculate the fill rate and the period of time to which a particular authorized markup apply will not coincide. The contractor will calculate the fill rate for the preceding 6 months when the 10th month of the contract is completed. The calculated fill rate and the data on which this calculation is based will be provided to DCMP within 30 calendar days after completion of the 10th month and thereafter each subsequent 6-month period for confirmation and concurrence of fill rate.

(e) The percentage of on-time shipments will be calculated on a semiannual basis. For this clause only, days will be calculated starting with the first complete day after receipt of the order; for example if the order is received at 4 p.m. Monday, shipment at any time during Tuesday will be counted as shipping on the first day. For the purpose of this clause only, months will be calculated starting with the first complete calendar month after the beginning of the contract, for example, if issue of the contract is 12 August 199X, the first month is September 199X. Complete records of the fill rate will be maintained and made available for Government inspection.

(f) The Government will prepare a modification to the contract adjusting the authorized markup as needed effective the beginning of the 13th month. The subsequent periods for fill rate calculation and authorized markup adjustment will be 6 months from each previous calculation/adjustment. The authorized markup for the initial 12-month contract period is XX% {100% of authorized markup}.

52.216-9G19

Corporate Contract—Inventory Transfer

(a) Inventory will be physically transferred from Government depots to the contractor for storage and distribution. The Government will retain title to the inventory. The transferred Government inventory may be used to satisfy both Government and commercial demands. Title to the inventory will transfer to the contractor upon use for a commercial sale. The contractor will notify the Defense Contract Management Command (DCMC) of this transfer by submitting a daily summary of all parts transferred for commercial use. DCMP will use the daily information furnished by the contractor to create daily requisitions while simultaneously giving approval for the commercial sale. The contractor will credit the Government monthly the current Military Spares Price List unit price for all material sold commercially.

(b) The transfer of Government inventory to the contractor will be accomplished in phases. In the first phase, a quantity of Government inventory, which will be determined by the Inventory Control Points (ICP), will be blocked from issue at the depot

and physically transferred to the contractor's facility at Government expense. All parts transferred must be new/unused and must have been sold to the Government by {date} as a new part. The contractor and the DCMP Quality Assurance Representative will jointly inspect the incoming inventory and incorporate it into inventory. A record of this transfer will be maintained by the contractor and provided to the cognizant administration office and the ICP. Any questions concerning the acceptability of the incoming stock or the amount of inventory received will be resolved before the contractor places the stock into its inventory and creates the record of the accountability for the inventory from the Government. Any parts that are not acceptable to the contractor will be returned to the Government at Government expense. If a part is transferred that was not sold by the contractor to the Government it may be deleted from this contract by bilateral agreement. The contractor will work with the contracting officers at the applicable ICP in resolving issues regarding the receipt and acceptance of the DLA inventory. The Government will bear the expense of correction and or disposal of any stock damaged prior to acceptance by the contractor. The contractor will be responsible for this expense after acceptance of the stock by the contractor.

(c) After the contractor accepts the first phase of transferred inventory, the Government will start routing requirements to the contractor via Electronic Data Interchange for the contractor to fill from its inventory. The Government will then issue a redistribution order to transfer the remaining Government inventory to the contractor. The contractor will follow the same procedures for receipt of the second phase and any subsequent phases of inventory transfer as it did in the first phase.

(d) Acceptance of inventory by the contractor creates an obligation to the Government which may be fulfilled by either supplying material to the Government or payment at the Military Spares Price List unit price. Notwithstanding any accident, loss, or damage by the contractor, the contractor is obligated to provide the Government one of the above said reimbursements.

(e) The contractor may commingle the Government inventory with the contractor's current commercial on-hand stock. The contractor shall be responsible and accountable for all Government inventory accepted into stock. The contractor shall provide for preservation, protection, and maintenance of the Government inventory in accordance with sound industrial practices. The contractor will maintain an accountable paper inventory of the transferred Government stock. The standard Government Furnished Property clauses and FAR Part 45 are not applicable to this inventory.

52. 216-9G20

Corporate Contract—Excess Inventory

(a) As part of the review of inventory levels, the contractor may identify Government-transferred inventory that could be classified as excess. The contractor will cross-reference this Government inventory to both Government and commercial demands.

(b) If the contractor identifies Government inventory that is potentially excess in terms of both Government and commercial demand, the contractor will identify these items to the appropriate Inventory Control Point (ICP). If the Contracting Officer at the ICP concurs in writing with the determination that the inventory is excess, the contractor will initiate action to dispose of the excess inventory through Government channels using the resources of the Defense Contract Management Command (DCMP). Excess inventory will be disposed of in accordance with the instructions of the DCMP contracting officer.

52.216-9G21 Corporate Contract—Government Inventory at Contract End

Notwithstanding contract completion, the contractor acknowledges that a credit at the current contract Military Spares Price List unit price or a replacement part is owed to the Government for all remaining transferred Government inventory. By written mutual agreement of the contractor and the Government, this obligation may be fulfilled by the contractor on a subsequent contract with the Government. The contractor agrees to provide notification to the Government of its proposed method of fulfilling the obligation 120 days prior to the anticipated completion date of the contract.

52.216-9G22 Corporate Contract—Add/Delete

(a) The Government reserves the right to bilaterally add to the contract new or replacement parts by modification. The price for the new items will be the manufacturer's current Military Spares Price List unit price plus the authorized markup determined by the contractor fill rate performance (see fill rate clause). The Government will unilaterally delete from the Contract items that are obsolete (discontinued by manufacturer) or deleted from the Military Spares Price List. The contractor agrees to notify the Contracting Officer of the anticipated change and will honor delivery orders for these items for 30 days from the date of the notification to the Government. The Government will delete any such item from this contract after receiving the required written notice. If the contractor considers another Military Spares Price List item as a suitable substitute or replacement for the discontinued item, it will advise the Government at the time it advises of the discontinued item. If the Government elects to include the replacement item in the contract, the contract will be modified accordingly. If the manufacturer discontinues an item without replacement, the contractor will advise the Government of an alternate source of supply for a comparable item, if an alternate source is available.

(b) When a new part number is added to the contract, inventory transfer will occur using the same procedures as the original transfer of inventory. These items will not be used in the fill rate calculation for the contract period immediately following addition of the item if no Government stock is transferred and the items fall under any of the conditions cited in 52.216-9G18 paragraph C.

52.216-9G23

Corporate Contract—Price Changes

(a) *Normal Price changes:* Since all items priced in the contract are based on the Military Spares Price List, a modification to the contract revising prices will be issued within 30 days of the issuance of a revised military spares price list. If the change in the unit price is equal to or greater than a 25% increase, the contractor agrees to provide a detailed price justification for that item to the DCMP Contracting Officer responsible for the Military Spares Price List. DCMP will validate the price increases. If DCMP justifies the price increase, the item will remain on the Military Spares Price List. If DCMP is unable to justify the price increase, the item shall be deleted from the Military Spares Price List. If it is discovered that a pricing error has been made, a contract modification or adjustment shall be issued for those delivery orders which incorporated the incorrect price. Any departure from this policy must be agreed to by both the contractor and the Government.

(b) *Extraordinary Price Changes:* Various circumstances that could arise during the term of the contract may render the pricing mechanism of using the Military Spares Price List invalid. For example, a disagreement over forward pricing rates could create a situation in which the Military Spares Price List is determined to be inaccurate and invalid. If the Government determines that the Military Spares Price List is invalid, the contractor agrees to honor the military spares price list prices in effect at the time of the determination for a period of not less than 60 days. The contractor and the Government must agree on any pricing mechanism that will substitute for the military spares price list beyond the 60-day period.

52.216-9G24

Corporate Contract—On-Time Fill of Backorders

A backorder is defined as a requirement for an item that cannot be filled within 8 calendar days of receipt of order. The contractor agrees to ship 90% of all backordered items within 90 days of receipt of the order. The remaining balance of backordered items will be shipped within 240 days after receipt of order. Receipt of the order is defined as the date on which the electronic transmission of the requirement is made from the Inventory Control Point (ICP) to the contractor. Shipment is defined as the date on which the item is delivered by the contractor to the designated carrier. The percentage of backorders filled on time will be calculated on a semiannual basis concurrent with the fill rate calculations.

SECTION H: SPECIAL CONTRACT REQUIREMENTS:

CONTRACT DATA REQUIREMENTS LIST

Notwithstanding any other provisions, terms and conditions of the solicitation/contract, the contractor will be required to make available the following data to the Government for the purpose of reconciliation and accountability purposes.

MATERIEL MANAGEMENT REPORTS: SEQUENCE AOO1

1. Stock receipted by the contractor.

A. The cognizant DCMP office personnel will work with the contractor in the receipting process.

B. The contractor will inspect incoming inventory and provide counts to the cognizant DCMP. Concerns regarding acceptability of incoming stock will be resolved through DCMP with the appropriate Supply Center prior to the contractor's receipt of inventory.

C. DCMP will confirm the contractor's receipts and will provide counts by NSN and Center to the accountable Supply Center. DCMP will be provided a Point of Contact at each Supply Center to forward inventory counts. Information required from DCMP for redistribution orders received is NSN, document number, quantity receipted, and condition code. For contract lines received, shipment number and contract line item number will also be required. This information should be provided to the accountable Supply Center on a daily basis as DCMP confirms the contractor's receipts.

D. Supply Centers will manually receipt stock to the contractor's RIC daily as information is received from DCMP.

E. The receipting process will extend beyond the completion of redistributing stock until all dues-in on contract or purchase request are accounted for.

2. Processing of requisitions

A. Until all stock levels are drawn to zero, the contractor will be required to submit month-end reports to the accountable Supply Centers of all issues made from transferred stock for commercial and military requirements. The following information at a minimum should be submitted to the Supply Center Point of Contact: NSN, requisition number (the contractor's requisition number if sold commercially), quantity, unit of issue, priority, required delivery date, and ship date.

FINANCIAL TRANSACTIONS REPORTS: SEQUENCE A002

1. SALE: DLA Parts to DLA Customer

A. Submit monthly invoice with two (2) lines (one for handling fee and one for transportation). Supporting documentation must be attached to invoice itemizing NSN, Military Spares Price List unit price, quantity, and transportation costs. One invoice can be for costs associated with sales and returns, but supporting documentation must clearly identify costs associated with sales and with returns separately. The invoice and supporting documentation must be sent to the respective Inventory Management Office at each supply center for validation and certification, after which the package should be sent to Accounting Services Office for verification of funds availability and for forwarding to Defense Finance and Accounting Service Contract Officer for payment processing.

SECTION H: SPECIAL CONTRACT REQUIREMENTS: (CON'T.)

2. SALE: DLA Parts to Non-DLA Customers

A. Will need supporting documentation from the contractor/Inventory Manager (cognizant) for the inventory manager's validation of payment amount from the contractor. (Requisitions by line, NSN, Military Spares Price List unit price and quantity).

CONCLUSION

The entire concept of I²LS requires a paradigm shift from a demand-based system of supply warehouses to a system that hinges on delivery times and order fill rates. This new concept is made possible because of advances in computer and communication technology, and in modern commercial transportation systems. The most difficult paradigm shift to achieve is from a system of extensive government control to a system based on best commercial practices. By allowing the contractor to use “best commercial practices” wherever possible, the process can be continually improved and modernized as technology advances. If current government stakeholders are willing to transfer some of their tasks to private industry without bureaucratic strings attached, the result would be an efficient and economical system. The greatest obstacle would be from those who know and understand the “old” way of doing things and want to hold on to the constraints that the new system attempts to eliminate.

Through I²LS, millions of dollars in obsolete inventory would be eliminated; inventory intended for initial spares would not be erroneously discarded due to lack of demand during the start-up phase of a system; delivery times once considered as premium transportation modes become routine; and what was once expensive and complicated can be less costly and simple. At one time, the term “economies of scale” referred to cost benefits for being large—a privilege enjoyed by DoD for over 50 years. Today, however, the most economical system is one that outsources its processes to smaller more responsive entities. With the current downsizing initiatives, the DoD can no longer continue business as usual. Commanders have been quoted as saying “we must do more with less.” The fact is, you can only do less with less if nothing changes. Einstein once commented that “doing the same thing over and over while expecting a different result is insanity.” Through I²LS, DoD can provide world-class logistics service at lower cost—we can expect more with less, but only by changing the way we do business.

