

Why Audit Warehouses?

Most of our attention to the audit process in this publication has been focused on “how to” but, underlying all this commentary is “why?” Auditing any operation is hard work. Indeed, some may believe that there are insufficient potential results to justify the effort involved.

Just as people get sick, warehouses have the ability to slip into trouble. Typically, the trouble does not strike suddenly, but creeps up in almost imperceptible ways, and is not noticed until it is difficult to correct. Deterioration of customer relationships is one example of trouble that can be very difficult to detect until it is too late and the damage has been done.

Management looks for benchmarks, or standards, and frequently they have not been established because measurements have not been kept. When data gathering is part of the audit process, it is relatively easy to create and revise performance standards. Management wants continuous improvement in profitability, but few people have reliable metrics to gauge the profitability of the warehouse operation. Measurements also serve as a baseline to consider new technology. The starting point of such considerations is to create a reasonable estimate of the benefits that will occur if the new technology is acquired. As processes are audited, you are likely to uncover redundancy in the form of reports and tasks that are assigned simply because “We’ve always done it that way.”

Relationships with people are fragile, and frequent examination of the people management process also can provide an early warning of potential trouble.

We also audit the physical side of the business: Facilities, housekeeping, and, inventory. The audit process provides early indication of related changes.

As we examine the “why” of the audit process, each of these points will be considered in greater detail.

Staying Healthy

The first reason we audit warehouse performance is to provide an early warning that the operation is slipping into trouble.

What are the signs of trouble in a warehouse? Illness can strike suddenly in people, but seldom is trouble a sudden occurrence in the warehouse. Recovery from illness also can be sudden, but we have never seen a troubled warehouse recover quickly. Because it is easier to correct the condition and reverse the process when slippage is detected in its earliest stages, the best way to maintain good

health in a warehouse is to create metrics, reports, and inspections that serve as an early warning system.

Housekeeping provides an excellent example. Good housekeeping is a matter of habit, as is bad housekeeping. When the appearance of a facility starts to change, there are always reasons. Perhaps the work crew is “too busy,” most likely meaning that management has set other priorities before housekeeping. Sometimes a single supervisor sets a poor example, or no example at all, and housekeeping in his/her department begins to deteriorate because the signal has been received that nobody cares. When sloppy habits become firmly ingrained, they can be difficult to change. For this reason, housekeeping requires constant monitoring, to ensure that excellence becomes a habit.

Damage control is another case where slippage can occur over time, as bad habits set in. Warehouse damage is often caused by careless, or sloppy handling. Observers have noted that most individuals drive their automobiles by habit, so a reckless driver handles every vehicle carelessly. The same habits can govern the operation of mobile lift equipment. Bad habits can be corrected by training, so training should be included in the audit process. When a warehouse crew has become accustomed to a certain level of warehouse damage, there is a tendency to accept the *status quo*. A regular audit process can assist management in discovering and correcting high levels of warehouse damage. In many cases, the audit might uncover an external cause, such as inadequate packaging.

Monitoring Customer Relations

The prime reason for the existence of warehouses is to provide better customer service than would be available without the operation. Relationships with people can be fragile and transient, changing as the people change. A warehouse manager who has maintained an exemplary relationship with one customer may need to behave differently if a key person at that company is replaced by an individual having different priorities and a different personality.

Customer relationships depend upon perceptions. Warehouse service is only as good as the customer *perceives* it to be. Those perceptions can change for subtle and irrational reasons, as basic as two people who are unable to work together.

For the warehouse service provider, customer relations are the lifeblood of the business. Consider this example. A

multi-city warehouse service provider replaced its retiring chief executive with a new individual. The new CEO was well liked by his subordinates, but over time it became apparent that his relationships with customers had developed some serious flaws. Only after the company had lost several of its largest customers, did it become apparent to the Board of Directors that the CEO had to be replaced. Within a very brief period, under this administrator, the company's customer relationships sustained serious damage that took many months to repair.

For the private warehouse operator, there may be several kinds of customers, both internal and external. For example, the distribution center for a specialty retailer exists to provide dependable service to the stores. In this case, the store managers are the customer. For the e-commerce or mail order fulfillment center, the customers are individual consumers. In some warehouse operations, the consignee that receives the shipment may be the customer's customer; yet, that consignee is truly the most important judge of our quality.

We monitor customer relations by asking the customers how they feel about service levels. It is easier to survey a relatively small number of store managers than it is to monitor the perceptions of millions of mail-order consumers; yet the measurement of customer relationships requires a constant need to ask everyone, "How are we doing?" When slippage is detected, we must find out why.

Auditing For Process And Cost Control

Does our warehouse operation cost more than it should? We can answer that question either by comparing our costs with those of similar warehouses, or by undertaking an engineering analysis to compare our operations with a productivity standard. Sometimes we arrive at a cost benchmark simply through historical analysis, and the presumption that costs this month should have some relationship to costs for the same month last year, or three years ago. If we control several warehouses, it may be useful to compare various cost areas for each operation.

In addition to cost control, we need to consider process control. We audit to determine if there is one "best practice" for order selection, and whether or not each and every order picker follows that procedure. Process control includes sequence, so we audit to determine whether or not the order in which jobs are being done is the best possible sequence, or whether the sequence followed in warehouse B is superior to the sequences used in warehouses A and C.

The new battleground for warehouse productivity improvement is information systems. Does the warehouse you are auditing have an information system that performs as well as it should? Are alternate systems in other warehouses better than the one used in the warehouse you are auditing? Just as we search for best practices in order selection, the audit should include a search for the most appropriate system for processing information.

Part of process control is the discovery that some operations, and even some warehouses, are redundant. Some operations that we perform quite well should not be done at all. Staging is one example. Automated checking and improved quality control have eliminated the need to stage and inspect at many receiving and shipping docks. If

this is the situation, and staging is occurring, it would be exposed as redundancy during an audit, and recommended for elimination.

Auditing To Maintain Quality

For the company placing high priority on quality control, the purpose of the warehouse audit is to be certain that the quality standards established elsewhere in the organization are maintained at the warehouse. For example, a quality audit might focus on lot control. In the production of pharmaceuticals and other products, each item may consist of several production lots, and each must be separated. Sometimes the newest lots are held in quarantine pending a quality clearance. The auditor verifies that all lot separations are maintained.

Auditing The People Relationship

Some companies take great pride in maintaining superior relationships with their workers. Many find it easier to maintain such relationships in the office than in the warehouse. Those companies intending to maintain a union free workforce recognize that warehouse workers may be more vulnerable to labor organizing drives than other company employees. For these reasons, the monitoring of interpersonal relationships is a necessary part of the audit process.

Our skill in managing people has quantitative as well as qualitative measures. We measure quality by asking people how they feel about their jobs, and quantity by examining employee turnover.

Monitoring Physical Assets

The two physical assets of prime concern in warehousing are inventory and storage facilities. A continuing storage density calculation should show our progress or lack of same in changing the number of units that can be stored in each square foot of space. The auditor may explore ways in which storage density can be increased through various kinds of mobile lift equipment, different types of storage rack or improved packaging.

While all warehouse managers must control the inventory they store, a few of them proceed from inventory control to inventory management. In the management function, they may discover that some of the items now in the warehouse could be eliminated with little or no impact on customer service; therefore, the audit process should do more than measure the success of inventory accuracy and control. It also should identify opportunities to improve the management of the inventory.

Justifying Warehouse Improvements

Warehouse managers often are competing with manufacturing, marketing, and other departments in the search for capital appropriations to improve their operations. The financial officer may be more impressed by a new machine for the factory than a new lift truck fleet for the warehouse. The audit process can be used to help management sell the financial people on approval of capital investments for the warehouse.

Every capital expenditure in the warehouse is justified by savings in space or time. We improve utilization of existing space by increasing storage density. If the purchase of lift truck equipment and/or new racking is needed to

improve storage productivity, the capital investment in that equipment is justified by the avoidance of leasing outside space or construction of additional warehouse space to handle a growing inventory. If space utilization has been tracked on a continuing basis, the process of demonstrating a payback is far easier than when no benchmarks for storage productivity exist.

For example, management may consider the option of constructing a 10,000 square foot addition at a cost of \$30 per square foot. As an option, the \$300,000 investment can be avoided or delayed by investing \$100,000 in storage rack, \$40,000 in narrow aisle trucks, and \$10,000 for labor to rearrange the warehouse. In this case, the capital cost is half the cost of new construction. By calculating the number of additional pallets that can be stored in the revised layout, justification is created that should be approved by the financial officer.

We improve productivity (use of time) by examining material handling. There are at least four ways to improve handling output: They are as follow:

- Use facilities and equipment for longer hours with multiple shifts
- Eliminate redundant processes, such as staging
- Refine and improve procedures, such as order picking
- Use technology to replace people

Consider this example: For \$300,000, you might purchase a palletizing machine that will arrange individual

cases in a specified pattern on a pallet. By using the machine on multiple shifts, you might replace the labor of four workers. The fully burdened cost of each worker is \$2500 per month, or a total of \$10,000 for the four people. The payback on the investment is 30 months (\$300,000 divided by \$10,000). The investment might be difficult to justify if the audit process had not provided good estimates of the current hours employed to manually palletize cases, and the burdened cost per labor hour.

When the labor market makes it impossible to find qualified people, tools to improve handling productivity become easier to justify. The labor market, as well as financial analysis, will influence the justification decision.

Putting It All Together

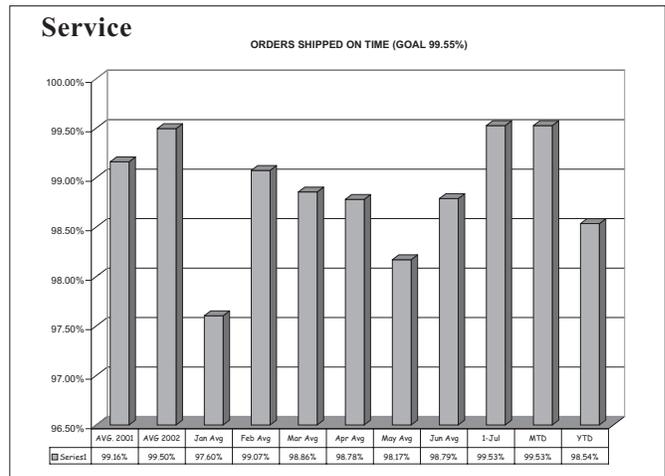
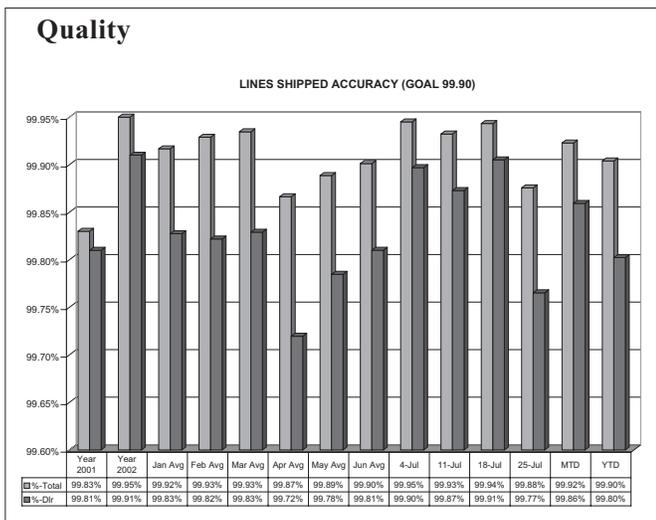
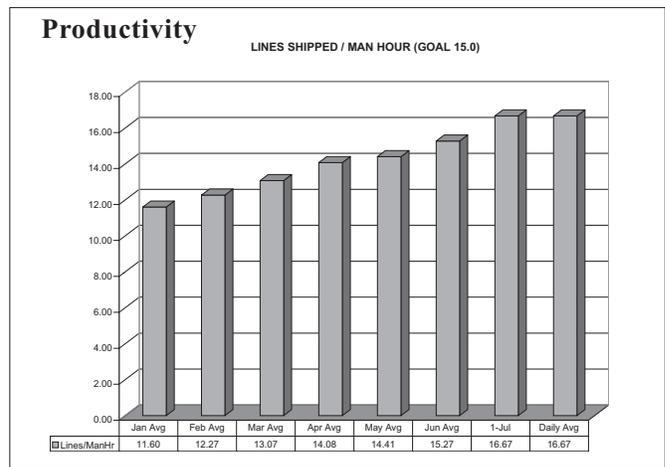
The process of auditing warehouse performance is sometimes ignored and frequently misunderstood. It is far more than a practice of giving grades or dispensing discipline. It is more than benchmarking, though comparisons may be part of the process.

Warehousing is deceptively simple. Many believe that the function is so basic that any manager can run an effective warehouse, but when the operation does not run smoothly, they do not understand why. We audit warehouse performance to get an early warning of trouble, to facilitate the search for best practices, and, to create an audit trail that records progress in improving the utilization of space and time.

A Three-Step Approach To The Performance Audit

Three charts shown below are used by a wholesale distributor to track the most critical elements of warehousing: quality, productivity and service.

Quality is measured in the “lines shipped accuracy” chart that shows how seldom customers complained about shipping errors. Productivity is shown in the “lines shipped/man hour” chart. Service is shown in the “orders shipped on time” chart, which tells the percentage of orders received by 4 pm that were shipped on the same day.



WAREHOUSING TIPS

A Primer On Fire Protection

This article was inspired by a white paper written by Linda Conrad, a risk engineering consultant with Zürich Services Corp.

It is easy to overlook some of the procedures that protect a warehouse from fire losses. For that reason, an average of 23,000 warehouse fires are reported each year in the United States, which cause more than \$500 million in property damage, along with 14 deaths and 243 injuries.

We constantly are surprised by the number of warehouses that are not protected by automatic sprinklers. One study showed that losses in unprotected occupancies were almost five times greater than those in sprinklered warehouses; yet, only five percent of commercial warehouses have sprinkler protection! Another surprise was the number of otherwise sophisticated warehouse operators who were unaware of the existence of ESFR (Early Suppression Fast Response) sprinkler technology. First developed nearly 15 years ago, this technology makes older sprinkler systems obsolete.

Two developments in contemporary warehousing have aggravated fire risk. One is the use of high rack storage, and the other is increased use of plastics, in both products and the packages that protect them. Rack storage can be protected, but some of the older sprinkler systems are inadequate for controlling a fire in racks. In addition to their ability to support combustion, the burning of certain plastics can release hazardous gases.

Finally, fire prevention starts and ends with concerned management. Unfortunately, we occasionally meet managers who display disinterest when fire protection issues are discussed. When managers react negatively, it is natural for the entire work force to do the same. Fire protection starts with the design of the warehouse, but it includes disaster training, and knowledge of ways to control the fire risk. The insurance industry has people who can train managers and workers to control fire risk, but none of this will work until senior management displays interest in improving fire protection.



Raising the Roof

Thousands of warehouse buildings constructed in mid century were designed for pile heights of 18 to 20 feet, state-of-the-art at that time. Many users of these buildings are reluctant to leave a valuable real estate location, but would like to convert the existing buildings to 21st century stacking capabilities. A Chicago engineering group, Epstein, has developed a system to raise the roof on existing buildings. Using hydraulic pumps, lifting progresses at a rate of about one foot per hour. When lifting is complete, existing columns are modified or replaced. For many users, raising the roof is a very attractive alternative for improving the utility of an existing building instead of moving to a new one. For more information, contact John Patelski, at (312) 429-8003.

In Defense of Floor Loading

By Peter G. Wilson, VP, Sonwil Distribution Center

Editor's Note: The feature story of our June issue contained this unfortunate statement: "It is difficult to understand why any shipper would floor load a vehicle." Peter Wilson exposed the error in that statement. We are pleased to present his essay in order to correct our error. While we still believe that most floor loading should be avoided, we heartily agree with Wilson's argument that there are situations when floor loading is the best approach. KBA

There have been instances where we have encouraged a customer to floor load their product. At other times, we deliberately floor load outbound customer's orders. Why? Because it makes financial and logistical sense.

One customer uses a production line that conveys the cases right into a trailer. Floor loading here allows 50% more product in a trailer. Furthermore, a skilled forklift operator is replaced by a less skilled loader. In this situation, it is more cost-effective to floor load this product, even with an extra charge for unloading and palletizing. Similar economies exist when we floor load outbound product on transcontinental shipments. Instead of going to the customer, the shipment moves to another warehouse service provider close to the destination. This provider builds stretch-wrapped pallets designed to meet the consignee's specifications.

Detailed in Figure 1 below, are the savings on shipments from our customer's plant in Canada to our distribution center in Buffalo. In this situation, there is a savings of 84 cents per unit, or nearly \$103 per truckload. When we send an outbound load from Buffalo to California, the savings are even more dramatic, even though another service provider is paid to unload the cases and build customized unit loads. In this situation, there is a saving of over \$1000. For this product, floor loading does not cost, it pays!

FIGURE 1

	<u>Truckload Palletized</u>	<u>Truckload Floor Load</u>
Total units per truckload	810	1220
Freight cost Canada to Buffalo	\$450.00	\$450.00
Freight cost per unit	55.6¢	36.9¢
Surcharge for unloading		\$125.00
Surcharge per unit		10.2¢
Total cost per unit		47.1¢
Savings per unit		8.5¢
Savings per truckload		\$103.70
Freight – Buffalo to California		
3 truckloads @ \$2,100.00	\$6,300.00	
2 truckloads @ \$2,100.00		\$4,200.00
Freight cost per unit	\$2.59	\$1.72
Unload & wrap charge		
\$185/TL x 2		\$370.00
Redelivery 3 @ \$235		\$705.00
Total cost – Buffalo to California	\$6,300.00	\$5,275.00
Per unit – Buffalo to California	\$2.59	\$2.16
Total savings		\$1,025.00
Per unit savings		.42¢

KEN'S COMMENTS

Does The Phone Work?



In this age of e-mail and faxes, sometimes we think there are people who do not care if the phone works or not. Before you cut the cord, consider some interesting facts. In one study by Howard W. Sams, it was found that 92.7 percent of users rank the telephone as their preferred communications method.

Customers who cannot find anyone to talk to have two choices: They can leave a voice mail message and hope to get a return call or, they can call a competitor.

How can you determine how well your company manages the telephone? Managers periodically should call their office from outside, to discover, what customers experience. If necessary, disguise your voice, but at least do your best to find out what kind of experience outsiders have when they call your office.

If you have a voice mail program, it is particularly important to check the user friendliness of your system. Is the caller always able to access a human being when necessary? Some voice mail prompts ask us to input the first four letters of the intended recipient's last name; but what happens when the caller has been working with Mary Jane and does not know her last name?

Do not assume that faxes and e-mails are foolproof. Will your fax machine continue to take messages if it is out of paper or toner? Is the machine busy for extended periods? Do some messages go to computers that are not monitored when the recipient is away from the office? Similar problems exist with e-mail. Who checks the mail when you are away? Customer e-mail should be sent to one mail box that is accessible to all where it is promptly answered. This is particularly important if the intended recipient is away from the office.

Today we have communications that were undreamed of a few decades ago; however, even with this technology, there is a need for common sense. Always assume that every caller could be a potential customer.



Redundant Handling

"All one can do, by physically moving stuff, is to harm it—one can spoil it and break it and scratch it and soil it. One cannot endow it with new economic characteristics." This is how the legendary Peter Drucker illustrated the waste involved in handling merchandise more often than is really necessary. Unfortunately, many people did not pay attention to Drucker, because most of us can go into most warehousing operations today and see unnecessary and unproductive staging requiring the rehandling of materials. Incidentally, Drucker's comments were made at a logistics conference 40 years ago!

Thoughts On Loyalty

An unfortunate hallmark of the logistics industries is high turnover. Many truckload carriers report turnover well above 100 percent, which means that the average employee stays less than a year. Obviously, the cost of replacing all of those people must be reflected in the fees charged for services rendered.

The worst part of this is a backlash. Some employers maintain that if a worker is not happy, then he or she can leave. Others believe that if the worker has no loyalty to the company, then the company need not have any commitment to the worker.

Yet, retention improvement is one of the best ways to improve quality and reduce costs. Hiring and training are very expensive processes, with errors and other quality problems occurring more frequently with new employees than with seasoned ones.

Studies have proven that workers are interested in many things besides a paycheck. Yet, most managers think their workers leave because of money. In the trucking industry, for example, frustration with working conditions is recognized as a major cause of turnover. The problem is waiting time before loading or unloading.

When workers receive no positive feedback, or worse, no feedback at all, they lose interest not only in the job, but in the company.

Still, it is relatively easy to maintain staff loyalty and interest. Recognition of successful work, constant feedback and rewards are proven methods of building loyalty. When a worker understands that the supervisor really cares, the result is an increase in loyalty.



Why Outsource Warehousing?

Even though we have asked and answered this question before, new experiences continue to provide new ideas.

First, we outsource to add place value. If an important customer cannot be served without an inventory in Los Angeles, and we do not have any warehouse in that area, outsourcing is the quickest way to solve the problem.

Second, we outsource to provide time value. If customer requirements indicate that we need two regional warehouses within the next 60 days and our company does not have the management available today to meet this requirement, outsourcing again is the simplest way to get the job done quickly.

Third, we outsource to enhance a customer relationship. Assume that Regional Retailers Inc. is our newest key customer. This Los Angeles-based chain has a preferred logistics service provider adjacent to their company warehouse, and they have urged us to place an inventory with that service provider. We consider outsourcing in order to maintain the relationship with an important customer.

Finally, we outsource to reduce risk. Our marketing people are convinced that a distribution center in the Pacific Coast area will greatly improve our sales but they might be wrong. Outsourcing is the best way to control the risk in a test market situation.

Who's Who in Logistics — 11th Edition

By Armstrong and Associates, ©2003, two volumes, 653 pages.

Each edition of this reference guide becomes bigger and better. This edition contains an increase in the number of international logistics providers, including new entries in Latin America. A report on the US warehousing market includes tables listing the 20 largest commercial warehouses in North America, the 20 largest refrigerated warehouses, and, the 30 largest companies that are *not* listed in this publication. The editor wrote that companies in the last group have become takeover targets. This publication is in a class by itself in the detail published about logistics service providers.



Inventory Positioning

By David Simchi-Levi and Edith Simchi-Levi, *Parcel Shipping & Distribution*, May-June 03, pg. 16.

Explored in this article is the difference between push and pull supply chains and how they influence inventory placement. The authors suggest an interesting compromise: "Push-pull supply chains." In a push supply chain, distribution decisions are based on forecasts, but the forecast is always wrong. In a pull supply chain, distribution is based on actual customer demand. The manufacturer only produces to order, which does not work when leadtimes are long. With the push-pull strategy, a manufacturer builds components to stock, and assembles the finished unit when an order is received. This process is also referred to as postponement, or delayed differentiation. Customization of the product is based on the pull supply chain, but production of the components is push based. The authors claim that this strategy will reduce inventory costs while providing short lead times.



Integrate Before Investing

By Mary Aichlmayr, *Transportation & Distribution*, January 2003, pg. 20.

Using case examples, the author describes one of the most common failings in the logistics business, the failure to fully integrate the transportation and warehousing functions. Inefficiencies on the transportation site can be much more costly than inefficiencies in the warehouse. The distances are obviously much greater in delivery on the highway than they are in order picking in the warehouse. There are two common software acronyms, TMS (transportation management systems) and WMS (warehouse management systems). These systems can and should be fully integrated; however, systems integration is no substitute for a tight relationship between the warehousing and transportation functions.

Guide to Classifying Industrial Property

By J. L. Yap and R. M. Circ, ©2003, by Urban Land Institute, 127 pages.

For those whose prime interest in warehousing is property investment, this reference book is a "must read." The authors are associated with First Industrial Realty Trust, Inc. A valuable foreword is provided by Professor J. R. DeLisle, of the University of Washington. Properties are first divided by industrial classification, then by location, and then by investment characteristics. Warehouse distribution is subdivided into regional warehouses, bulk warehouses, heavy distribution, refrigerated distribution, and rack supported warehouses. Described in the location section are the kinds of sites that are most suitable for each of the property types. Included in the investment section are typical internal rates of return and cap rates for each type of property. A section on supply chain tells how this new concept is changing the use of industrial real estate.



The Upside of Risk

By Mike Kilgore, *Chief Logistics Officer*, April 2003, pg. 8.

Logistics is a risky business, and this unusual essay turns the spotlight on those events that are most likely to cause trouble. They can be summarized as, "too many eggs in one basket." The author described five kinds of concentration that will cause trouble. The first is concentration on one site, or the procurement of an item that is produced in only one plant. The second is concentration of sources, or reliance on a single vendor. Third, is concentration on one transport mode which creates a problem if a labor dispute causes a shutdown similar to the West Coast dock strike. Service concentration, or reliance on a single carrier who may not be able to handle a spike in volume is fourth. Fifth and final, is capacity concentration which often is found in the auto industry, where there is high capacity and low inventory. If the flow is disrupted, as trans-border shipments were after the 9/11 attack, assembly plants will be shut down.



Macro View

By George Shultz, *APICS*, June 2003 pg. 28.

Proceedings from a recent meeting of Supply Chain Council, an organization with 700 member companies are reported in this article. The most critical supply chain management manager is the delivery of cash. Improved return on capital receives greater emphasis than ever before. Effective supply chain management can be a source of capital appreciation. Wall Street rewards some companies for exceptional supply chain execution. All of these statements are opinions that were expressed by the various executives attending the conference.