

ERGONOMICS DEMONSTRATION PROJECT

Update

ACE Hardware

A retail goods distribution warehouse

December 2001



Ace Hardware – A Retail Goods Distribution Warehouse

Executive Summary

This demonstration project began as the Ace Hardware Retail Support Center in Yakima Washington began to explore the new WISHA regulation on ergonomics. As a distribution warehouse employing about 250 employees, many in highly manual occupations classified as material handling, the Ace Yakima facility has long focused on workplace improvements using technology, equipment and innovative material handling methods to both improve team member safety, enhance the job satisfaction, and increase operational efficiency. The project was intended to assess the workplace hazards under the regulation, as well as review existing controls voluntarily initiated by the company, and develop a plan moving forward under the new rule.

The goals of the Ace Hardware demonstration project are to show that an employer can:

- Identify caution zone jobs
- Provide awareness education as required by the ergonomics rule
- Determine which risk factors in caution zone jobs reach hazard levels
- Identify and implement controls to reduce employee exposures below hazard levels

The project found that while requiring an investment in time and some initial assistance from a risk management specialist, the company was able to identify caution zone jobs using in-house personnel. While team members engage in a number of the motions and postures identified in the regulation, in most instances the frequency was less than that required to be identified as a caution zone. The initial studies found that caution zones exist in the classifications of heavy lifting and back bent more than 30 degrees. Only the heavy lifting activity is of sufficient frequency and/or intensity to reach the hazard zone definition. While not all jobs fall into the caution zone, the warehouse's initial plan is to conduct employee awareness education for all team members. The Yakima team has itemized a number of workplace changes already accomplished and is in the process of implementing additional projects that enhance business objectives and further introduce ergonomic controls. The facility is refining future projects targeted at those activities that continue to be identified as falling into hazard zone.

As the project continues it has become evident that the company will need to continue to conduct ergonomic analysis to verify caution and hazard zone classification as methods change, improvements are introduced, and team member participation is sought.

Ace Hardware – A Retail Goods Distribution Warehouse

Project Description

THE ACE HARDWARE YAKIMA RETAIL SUPPORT CENTER is a 19-year old distribution facility in Central Washington. The building, 509,000 square feet in size, houses more than 60,000 SKUs, encompassing hardware, tools, paint, electrical, house wares, lawn and garden, farm and ranch supplies, automotive and other departments. The warehouse operation is not designed for automated material handling and relies primarily on manual handling of product. About 250 employees are based at the facility, including truck drivers, material handlers, administrative and management team members.

KEY PERSONNEL associated with this project included the warehouse management team, the safety and loss prevention supervisor, the Senior Loss Control Consultant from the Yakima warehouse's self-insured work compensation administrator, and safety committee and other team members who participated in the initial ergonomic job analysis.

THE PROCESS – IDENTIFYING CAUTION ZONE JOBS AND JOBS REACHING HAZARD LEVELS

Initial information about the Washington Ergonomics Rule was gathered by attending Labor and Industries regional meetings where an overview of the rule was presented, and handouts were provided. Given the material handling nature of the business, the Yakima management team was eager to determine the extent of impact of the new rule. It was considered critical to determine whether any activities at the facility fell into the hazard zone, and begin planning and budgeting for expenditures, if required, well in advance of the implementation date.

The management team began meeting with their loss control consultant in July 2000 and developed a plan to videotape various jobs and evaluate those jobs. There was a dual objective of immediately using the material to help reduce strain/sprain potential by analyzing the actions and coaching for safe behaviors, and also help meet the rule requirement of conducting "Caution Zone Job" evaluations.

Methodology was primarily developed based on information presented in Labor and Industries publications. One meeting with Department of Labor and Industries staff occurred in December 2000, in which some validation of the process occurred, and some minor questions were resolved.

The jobs evaluated include:

- **Receiver** – works with forklift and pallet jack and hand-held scanner to receive, check in freight by verifying receiving documents, and position for subsequent stocking process. May stack and sort individual items.
- **Break Stocker** – works with hand held scanner, pushcart, and forklift to verify and stock small items (0 – 50 pounds) in bins.
- **Full Case Stocker** - works with hand held scanner and forklift to verify and stock large items (10 – 70+ pounds) in large storage racks.
- **Break Order Filler** – works with pushcart, stationary scanner and monitor to select and pack retail orders of small items into plastic totes.
- **Full Case Order Filler** – works with motorized equipment and carts, hand-held mobile scanner and monitor to select and pack retail orders of large items onto pallets and into containers.
- **Loader** – works on conveyor line to sort plastic totes onto pallets, and loads pallets and containers onto truck using manual and forklift assistance for delivery to retailers and prepares appropriate documentation.
- **Truck Driver** – operates a semi truck and trailer(s) to deliver palletized and individual totes and containers to retail locations. Physically offloads goods at store receiving area, using hand-held scanner and printer, hand pallet jack, lift gate, and/or by hand.
- **Administrative Support** - various administrative activities.
- **Janitor** – various janitorial functions including operation of power equipment, dumping trash, sweeping, light maintenance and emergency response.

The first videotaping occurred in August 2000. Immediately the opportunity for personalized safety coaching became apparent, as one individual demonstrated a personal work style that created excessive bending/bent neck/stooping activities not necessary to complete the task. Analysis of various jobs continued through February 2001.

The videotaping team determined that most jobs were sufficiently routine in nature to ensure the full range of the job would most likely be encompassed in a 15-30 minute interval. Usually, at least two job incumbents for each job were included and the results sometimes varied by person. Additional source information was used to determine the probable frequency of lifts greater than 25 pounds. Two trained reviewers analyzed the video, counting the frequency of all activities identified by the rule. The ability to pause, slow motion view and replay the video was invaluable. Reviewers estimate that 15 minutes of video required as much as two - three hours to analyze. Results of the analysis were summarized on an in-house worksheet designed by the loss control consultant, and then reviewed with the team member who participated in the project for validity. In some instances additional observations were conducted to resolve difference between the analysis result and the team member's belief regarding their frequency and intensity of activity. In other instances the team members' observations were immediately validated, and became part of the final analysis.

THE RESULTS of the analysis consistently identified numerous lifting activities in some jobs with a frequency placing the job in the caution zone. These jobs include Full Case Stocker, Full Case Order filler, Loader and Truck Driver. Most of these exceed caution zone limits, and actually reach hazard levels. The analysis also identified some jobs with variable results by individual team member regarding frequency of actions involving bending the back more than 30 degrees. The frequency of these actions resulted in a caution zone designation only.

ERGONOMIC CONTROLS TO REDUCE EXPOSURE

For a number of years, the Yakima team's approach to addressing ergonomics issues has been to seek incremental change in process, equipment and procedure to reduce risk of injury. Facility constraints and financial resources do not support extensive automation efforts.

Some of those controls that the Yakima warehouse has implemented include:

1. Inbound Receiving procedures were changed to incorporate full-pallet receipts of mixed goods without individualized check in, thereby eliminating at least one team member's handling of the product, and facilitating greater use of forklift versus manually handling of the product. Overall this procedure reduced frequency and intensity of lifting requirements. Simultaneous business benefits resulted from improved labor efficiencies.
2. Outbound containerization capabilities were developed that allow containerization of stock on pallet or in palletized containers to be loaded on trailers and delivered to retailers. Trucks were equipped with power lift gates that allow palletized items to be raised and lowered to ground level for delivery to locations without a receiving dock. The previous method involved hand loading all merchandise onto the truck, and hand unloading the merchandise at the store delivery. The new method of delivery eliminated the need for both the loader and the driver to lift every individual piece of freight to a retailer. It also reduced the lifting demands for the store employee. Current containerization rates are above 90%. While total cube utilization in the trailers decreased, simultaneous positive business outcomes include less product damage, fewer misdeliveries, and increased equipment utilization and labor efficiencies.



Full Case Orderfiller sets up a container into which he will place merchandise contained in a store's order. The container eliminates manual handling of each item by subsequent steps in the distribution process including both loading and unloading the truck.



Loaders demonstrate new methods for shipping freight that involve the use of containers, fork lifts, pallet jacks and trailer lift gates instead of manual handling of each item shipped.

3. Assorted contents of Break Department order fill totes are limited to 50 pounds by safety policy. New order fill scanning technology automatically records and maintains a running tote weight on a computer monitor, signaling the order filler as the maximum weight is neared, and/or exceeded. This lessens the physical lifting demands on the loader, driver and store employee.
4. Newer pallet-sized containers used for shipping are transparent, allowing those team members handling the container to visually assess the contents and make more informed handling decisions, and reducing the need for awkward and unexpected lifting requirements. Openings on the container have been redesigned to create a larger and deeper opening enabling the order fill to use better lifting posture when placing items in the containers.
5. New wheels have been installed on Full Case Department carts, lowering the cart to allow the order filler to select and load stock with improved lifting posture.



Order Fill carts have been modified with smaller wheels that lower the platform several inches. The modification results in less lifting above the shoulder and creates better lifting posture during placement of merchandise into the containers.

6. Stock locations in the warehouse have been “reprofiled” or relocated, to create improved access, better body posture and more orderly stock bins. This includes elevating the maximum height of some bins to avoid stooping, elevating the floor of some bins to lessen bending requirements, positioning items at the best height based on their size and weight characteristics, and grouping like items to create more stable loads. Business objectives were accomplished by grouping like items in shipping containers to improve customer satisfaction, and increase stocking and order filling efficiency.



Left photo: Lifting conditions before improved controls were implemented. Right photo: Full Case Orderfiller demonstrates improved lifting posture due to warehouse reprofiling project that raised both the height of storage bin from the floor and increased maximum headroom.

7. A separate area of the warehouse has been created to contain “obnoxious” items which are not necessarily heavy, but problematic in how they fit in the bin and in the shipping container, and often awkward for the order filler to handle. As this project matures special order fillers will be designated for this area, that are experienced and familiar with the special handling requirements, and a forklift will be designated as an aid to assist in lifting some items. Restricting access to trained individuals will increase likelihood that proper lifting mechanics are utilized. Proper and/or specialized bin storage configurations and special lifting aids will reduce lifting actions that cause concern for injury.



Examples of warehouse items reprofiled to a specialized area with ergonomic controls in mind. Adequate space is allowed, and access will be limited to properly trained individuals.



Storage bins are constructed with a floor slanting forward easing access for both Stockers and Order Fillers.

8. A loop conveyor was installed in the Shipping department to better control the flow of totes on the conveyor as they are segregated and loaded onto pallets. Use of this device reduces the lifting speed required by surges of totes coming down the line, allows the loader to spot and strategically palletize particularly heavy and light totes on the stack, and has significantly improved operational labor efficiencies.



The Sort Line: Operator using the loop conveyor is able to allow incoming totes to circle the line as needed, preventing hurried movements to prevent backups during peak flows. The outer circle of the conveyor allows the operator to selectively position totes for placement of the pallet – lighter totes on top and heavy totes on the bottom.

9. Targeted training focuses on teaching new employees correct lifting procedures, with specific instruction on how to handle some troublesome items, such as water heaters, buckets of chain, and rolls of barbed wire.



Left photo: New employees may try to "bear hug" lift a waterheater onto their cart. Right photo: Targeted employee training creates hands -on learning opportunities to practice correct material handling methods, such as using leverage to slide a water heater into position.

10. An inexpensive hook was designed and fabricated to assist the full case order filler in reaching awkward items located at the back of storage bins. The order filler can hook the item and pull it forward to a more comfortable position of lifting and placement in the shipping container. Each order fill tugger is equipped with the tool. This prevents the order filler from assuming awkward or unstable postures to reach an item.



An Order Filler demonstrates use of a simple hook to pull items to the front of the bin for better lifting technique.

11. The frequency of forklift assists has increased significantly. Fork assists replace the manual lifting activities of an order filler with mechanized forklift operations when full case quantities or very heavy items are called for in the order filling process.
12. Break Order fill carts are equipped with a stable step ladder to enable the break order filler to assume a better body position when reaching into overhead bins and reduces the need to reach above shoulder.
13. Stacks of supplies such as plastic pallets and containers are maintained for easy access. Stored on their side instead of stacked upward from the floor, they are more easily handled, reducing the need for awkward lifting.

CONCLUSION

This project has demonstrated that an employer is able to identify caution zone jobs with trained in-house staff. There is an investment of time, staff and resources necessary to conduct the analysis. Periodic continued analysis of jobs is likely to be necessary due to the incremental approach to ergonomics issues. As changes are implemented, the company will need to review their impact on the job. The incremental approach is driven not only by facility's circumstances, but also by the method of team member participation and input which keeps the process of continual refinement and innovation alive.

Over the past year, very positive safety trends have developed. Corporate safety statistics show the recordable injury rate is down 43%, lost workdays are down 63% and modified workdays are down 72%. The ergonomics program is one component of a multifaceted safety program.

In addition to continuing to conduct ergonomic job analysis, the next phase of the project will encompass developing an employee education program. At this time, the warehouse intends to begin with the training materials developed by the Department of Labor and Industries, customizing it to the work environment at the facility. Additional training materials will be identified to strengthen the understanding and skills of the safety committee, team leaders and front-line supervisors with regard to their role in supporting the ergonomics program.

In addition to completing some of the projects currently in process that were discussed earlier, the Yakima team is beginning to identify and develop the next phase of projects. These projects are targeted at adding controls to those job tasks that are still classified as hazard zone jobs.

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