Workplace Ergonomics: Is It All Pixie Dust?  
Moving Your Program from Imaginary to Reality

Bob Button, M.S.  
Director  
Safety In Motion, Inc.

Bob Howarth, CSP  
Manager, Safety Services  
Walt Disney Parks & Resorts

Overview

Walt Disney Parks and Resorts is continuously developing broad-based ergonomic expertise and integrating ergonomics into project design, service operations, and maintenance operations. This long-term, multi-dimensional process is designed to reduce soft-tissue body motion injuries and to improve productivity.

This paper discusses how Disney moved its program from imagining ergonomic improvements on paper, to applying ergonomics in design, operations, and maintenance in ways that benefit employees, guests and operational efficiencies.

Examples of both practical challenges as well as real successes are drawn from food and beverage, housekeeping, warehousing, and merchandise operations.

Objectives

- Provide data on the scope of body motion injuries (strains, sprains, MSDs) in the service industry.
- Define the challenges to successful implementation of ergonomics and body motion injury risk reduction faced by the service industry.
- Identify the key roles required to successfully prevent or reduce body motion injuries in the fast-paced service sector.
- Describe the process of developing and communicating ergonomic knowledge to the work force.
- Identify selected case studies of developing ergonomic improvements and related administrative controls.
Discussion

Scope of Body Motion Injuries in the Service Industry
According to the U.S. Bureau of Labor Statistics (BLS 2011), body motion injuries (also known as musculoskeletal disorders (MSDs) or ergonomic injuries) to the back, shoulders, legs, and arms accounted for 29% of all injuries resulting in days away from work. The median number of days away from work for all body motion injuries is eight. However, in service industries, such as merchandise sales, food preparation/table service, and custodial work, both the incident and lost day rates are significantly higher. These numbers did not change significantly between 2010 and 2011.

It’s estimated that 130 million people work in the service industry in the U.S. Lost work days and workers’ comp claims only begin to describe the true costs associated with these injuries. The human cost, in terms of pain and limited mobility, can be life changing. It’s clear that reducing ergonomic hazards and injuries can have a substantial impact on an organization’s overall performance, including profit, quality, efficiency and safety.

Challenges to Ergonomic Prevention of Body Motion Injuries
Why are service organizations challenged when it comes to preventing body motion injuries? What are the limiting factors that stall or frustrate ergonomic programs?

One important factor is the number of “qualified” people working on, and supporting the use of, ergonomic improvements. When organizations rely exclusively on a highly qualified but small team of ergonomic experts, the number and type of ergonomic improvements that company can implement and support will remain small. This is a real problem for any organization with operations that involve a wide variety of environments, tools, equipment, and supplies.

For example, here is a list of roles and associated material handling tasks in three common service businesses. Each of these businesses present a broad array of challenges when trying to reduce the risk of body motion injuries through engineering and administrative controls:

- Food service roles and sample tasks
  - Servers: Table service requires repetitive carrying of heavy food, drink, and dishes, and then reaching around guests to place the plates, drinks, and other items on the table.
  - Cafeteria-style service requires removing and replacing heavy and hot trays of food, as well as sweeping, mopping, moving chairs and tables.
  - Culinary: Large-scale food preparation requires the use of a variety of manual and motorized tools to cut, shred, mix, spice, or tenderize food ingredients.
  - Cooking requires moving quantities of hot foods between stove and counter.
  - Plating requires assembling prepared food onto an array of dishes laid out on a large counter.
  - Stewards: Repetitively clearing, cleaning, and setting tables.
  - Carrying heavy tubs of dishes from table to kitchen.
  - Pushing, carrying and arranging tables and chairs.
  - Lifting, placing and connecting heavy bag-in-a-box containers of soft drink syrups on shelves at various heights.
• **Merchandise roles and tasks**
  Receivers: Lift and carry a diverse array of packaged goods from trailers to stockrooms. Push and pull pallet jacks, carts or hand trucks.
  Stockers: Retrieve goods from stockroom shelves or pallets and move to “on stage” display shelves and tables. Monitor display areas and re-fold clothing or re-set displays.
  Point of Sale: Highly repetitive scanning and bagging of merchandise. Handing bagged merchandise across wide counters to guests.

• **Hotel roles and tasks**
  Bell services: Retrieve luggage from guest vehicles. Carry, store, and retrieve luggage in storage area. Deliver and pick-up luggage from guest rooms.
  Engineering: Perform a wide variety of maintenance and repair activities in environments that are designed for guest comfort, not maintenance work (i.e., fix plumbing, lights, TV, A/C, etc.)

The above roles are just the beginning for the Disney ergonomics team. They must also address the diverse custodial and horticulture tasks that involve repetitive reaching, lifting, carrying, gripping, pushing, and pulling various tools and equipment. By comparison, a job like transportation driver may seem easy, until that driver has to assist a disabled guest who is using a wheelchair or scooter. And, of course, there are also the physical tasks required to operate various rides (attractions) and to perform for guests (entertainment).

**Identifying Who Should be Involved in Developing and Implementing Ergonomic Solutions**
In a large-scale operation like a Disney resort, the diverse environments, roles and tasks result in a mind-boggling array of material-handling events and methodologies. And this is not a static set of challenges. The environments, the tools and equipment, and the people doing the material handling tasks are in a state of continuous change.

A successful body motion injury reduction process requires a very broad cross section of organizational partners who are motivated and qualified to help with ergonomic hazard recognition, risk reduction, and preparing employees to understand and effectively use ergonomic improvements.

These partners include:
- **Business leaders** who understand the service requirements, staffing, and operating procedures in their locations.
- **Frontline employees** who know how the work is really performed and understand the details of specific material-handling tasks.
- **EHS professionals** who may not be ergonomists by training but are tasked to reduce the risk of body motion injuries (along with all the other EHS risks).
- **Health services professionals**, including nurses, physicians, therapists, etc., who often see the patterns of pain and discomfort in relation to specific roles and locations.
- **Training content developers and the trainers** responsible to teach employees how to use ergonomic equipment and perform material-handling tasks.
• **Human resources personnel** in charge of documenting job requirements and making hiring decisions.
• **Procurement professionals** who often decide the specifics of both the materials being handled and the material-handling equipment being purchased.
• **Engineers** who design or specify the environments and equipment that everyone else is expected to use.

**Developing and Communicating Ergonomic Knowledge**

How do Walt Disney Parks and Resorts leverage and integrate ergonomics into daily operations, facility maintenance, and new design projects?

The first step is to provide education and training that makes basic ergonomic risk recognition, and practical ergonomic risk reduction, both intuitive and easy to communicate. This is accomplished at Disney by using multimedia training content provided by Safety In Motion, Inc. New cast members (employees) participate in a 50-minute interactive training module that introduces:

- four postural risk factors that are easy to see and feel: leverage zones, end-range joint motions, spinal alignment, and foot position
- seven techniques for reducing unnecessary physical stress on the body while performing physical tasks that involve reaching, pulling, pushing, lifting, carrying, sitting, and using tools.
- A system for improving ergonomics through better use of tools and equipment, body positioning, fitness, and early intervention.

Experienced cast members take an annual 8- to 15-minute, multimedia Safety In Motion® online refresher and knowledge assessment.

The next step is to give selected partners more advanced training that enables them to productively participate in ergonomic evaluation and solution development. This training is designed and provided by the EHS staff that are the resort’s lead professional ergonomists: Joanette Lima and Daniel Padilla.

The ergonomics and communications teams collaborate to provide monthly ergonomic tips in the cast newsletter. This spreads and reinforces ergonomic techniques and improvements.

How far does this integration of ergonomic resources go? It extends to on-the-job training, safety audits, formation and preparation of interdisciplinary design teams (imagineers, operators, artists and EHS staff).

**Case Study Examples of Ergonomic Improvements and Related Administrative Controls**

1. **Designing and building a new attraction in Disney’s California Adventure.** Building a new attraction, such as Radiator Springs Racers, presents opportunities to address known ergonomic risks experienced in existing attractions, as well as never before seen risks by identifying them early and designing them out. Employing common language and leveraging ergonomic design criteria gives designers and operators the greatest chance of creating and experience where no one gets hurt.

2. **Redesign of Outdoor Vending (ODV) carts.** ODV carts have traditionally been pushed and moved manually all over theme park properties. When the opportunity to redesign carts comes along, we consider not just the enhancements to interacting with the cart features and
equipment while serving guests but also how to get carts on and off stage for cleaning and service.

3. *Merchandise height-adjustable tables.* It’s a classic challenge faced in all merchandise stores and not just in theme parks: how to accommodate the wide range of abilities of our cast working the point of sale (POS) and service a diverse population at the same time. Adjustability is one significant step to achieving enhanced interactions.

4. *Cast seating and guest loading and unloading at the Storybook Land Canal Boats in Fantasyland.* This Disneyland Park original attraction opened with the park in 1955, and has remained largely unchanged ever since. Although largely unnoticed by guests, a modification that focused first accommodating the cast member while seated drove additional design changes and ultimately enhanced cast member safety and guest interaction.

5. *Custodial improvements to hose and nozzle equipment.* Cleaning the parks each night is important and yet is often overlooked. Providing tools and equipment that allow the cast to perform these labor-intensive tasks night after night without injury is a major goal of the ergonomics program.

6. *Design improvements to entertainment costumes.* There is perhaps nothing more important to our guests than the opportunity to interact with their favorite Disney character. The costumes have to be designed so that they are not only true to the stories from which they are drawn, but safe for the performers who wear them.