

Ergonomics vs Human Factors: What's the Difference?

Presentation
To
UPA Twin Cities Chapter

Overview

- Definitions and Difference between HF and Ergonomics
- Goals of ergonomics
- Types of Cumulative Trauma Disorders
- Case Study of ergonomics
- Observations & Conclusions
- Discussion & Questions

Human Factors & Ergonomics Defined

- “Human Factors discovers & applies information about human behavior, abilities, limitations, & other characteristics to the design of tools, machines, systems, tasks, jobs, & environments for productive, safe, comfortable, & effective human use.” (Chapanis, from Sanders & McCormick)
- Ergonomics is the study of work & how it affects people. (from ergos = work & nomos = laws)

Difference Between HF & Ergonomics

- Human Factors is proactive (practiced before the fact), trying to *prevent* errors, etc.
- Ergonomics is practiced after the the fact (reactive); i.e. *after* injuries have already occurred.

Goals of Ergonomics

- Reduce injury potential
- Optimize comfort
- Enhance productivity
- Minimize cumulative stress

Cumulative Trauma Disorders

- Also called
 - Repetitive Stress Injuries (RSIs)
 - Work-Related Musculoskeletal Disorders (WRMDs)
 - Over-use injuries
- CTDs are:
 - Cumulative - develop slowly over time
 - Trauma – injury from mechanical stresses
 - Disorders – physical ailments

Old Names for Specific CTDs

- Bricklayer's Shoulder
- Carpenter's Elbow
- Stitcher's Wrist
- Game Keeper's Thumb
- Telegraphist's Cramp
- Cotton-Twister's Hand
- Manure Shoveler's Hip

Types of CTDs

- Tendon Disorders
- Nerve Disorders
- Neurovascular Disorders

Tendon Disorders

- Tendonitis
- Tenosynovitis

Nerve Disorders

- Carpal tunnel syndrome
- Cubital tunnel syndrome

Neurovascular Disorders

- Thoracic outlet syndrome
- Vibration syndrome

Causes of CTDs

- Excessive Repetition
- Awkward Postures (Demo)
- Excessive Force
- Cold Environment

Different Types of Ergonomics

- Industrial Ergonomics
 - Practiced in a manufacturing environment to reduce on-the-job injuries
- Office Ergonomics
 - Practiced in the office to prevent CTDs (primarily Carpal Tunnel Syndrome)

Case Study

- Roofing Firm
- Employees were suffering from CTDs
- Onsite evaluation of jobs was performed
- Jobs included:
 - Warehouse jobs
 - Roofers
 - Materials loaders

Ergonomic Product Design

- Example: Hand tool design
- Using anthropometry, measures of force applied, how tool is held (awkward posture)
- Material used to absorb vibration in handle

Conclusions and Observations

- Ergonomics and Human Factors differ in their focus
- Ergonomics focuses on Work and injury reduction
- Human Factors focuses on product & system design
- Originally, HF and Ergonomics were synonymous

For More Information on Ergonomics

- Books
 - *Ergonomics for Beginners: A Quick Reference Guide* by Jan Dul & Bernard A. Weerdmeester
 - *Cumulative Trauma Disorders* by Vern Putz-Anderson
 - *Ergonomic Design for People at Work, Vol. 2* by Eastman Kodak Company Ergonomics Group

For More Information on Ergonomics

- Websites

- www.osha.gov – regulations, preventive reports, etc.
- www.ergoweb.com - products, news, reports
- www.alimed.com - ergonomic products
- www.cdc.gov/niosh - case studies, methodologies
- ergo.human.cornell.edu - research studies, methodologies, reports

- Periodicals

- *Ergonomics in Design* (Human Factors & Ergonomics Society)
- *CTD News*

Questions / Discussion

- Questions?
- Discussion