Langley Research Center Ergonomics Program Overview

July 8, 2008

NASA Langley at a Glance

Founded in 1917

1st civil aeronautical research laboratory

~3,400 Workforce

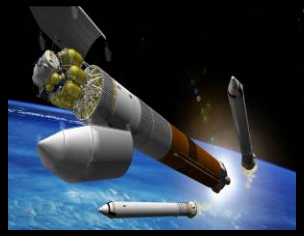
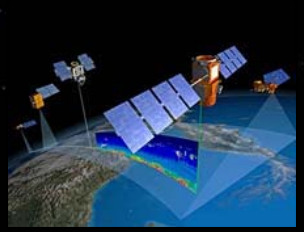
~1,900 Civil Servants

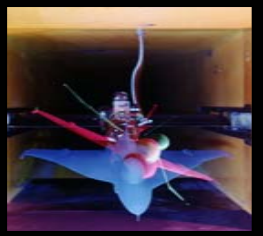
~1,500 Contractors

Infrastructure/Facilities

- 788 acres, 241 Buildings
- $2.7 B replacement value

Aeronautics **Exploration** **Science** **Space Ops** **Institutional Support** **Cross Agency Programs** **External Business**

LaRC Ergonomics Program

- LPR 1820.2 – Created from existing draft
  - provides framework for preventing and managing musculoskeletal disorders (MSDs)
  - applicable to all LaRC facilities and employees
  - lists responsibilities of Ergonomics Program Officer
  - duties of “Ergo Evaluators”

NASA
Langley Research Center

LPR 1820.2
Effective Date: July 22, 2004
Expiration Date: May 25, 2009

LANGLEY RESEARCH CENTER ERGONOMICS PROGRAM

National Aeronautics and Space Administration

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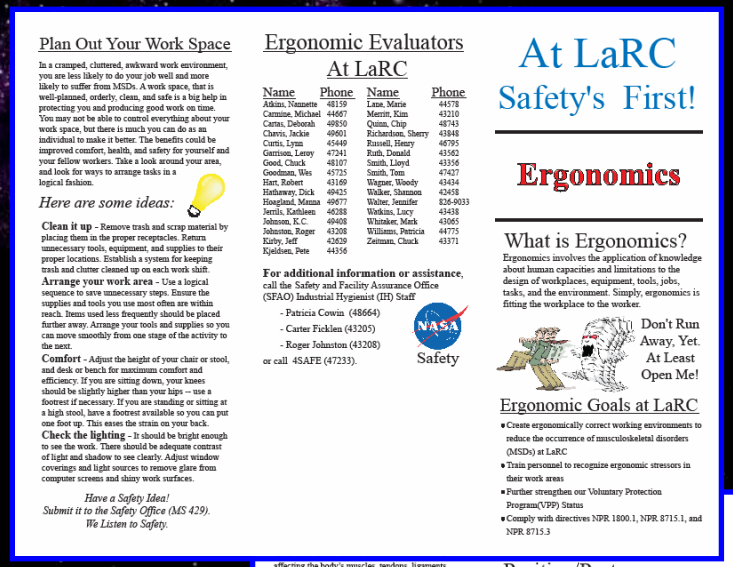
Implementation

- Ergo Committee Formed to determine course of action
  - Members selected from various organizations
  - Received 3 day Ergo training
  - Members recruited ergo evaluators
- Trained Ergo evaluators January 2004
  - USACHPPM Ergonomist and Occ therapist
  - Week long training with hands-on exercises

LaRC Ergonomics Program

- Ergo Tri-fold
  - Distributed to all employees
  - Provides general information regarding risk factors and how to reduce or eliminate them
  - Lists names and phone numbers of ergo evaluators available to help



Plan Out Your Work Space

In a cramped, cluttered, awkward work environment, you are less likely to do your job well and more likely to suffer from MSDs. A work space, that is well-planned, orderly, clean, and safe is a big help in protecting you and producing good work on time. You may not be able to control everything about your work space, but there is much you can do as an individual to make it better. The benefits could be improved comfort, health, and safety for yourself and your fellow workers. Take a look around your area, and look for ways to arrange tasks in a logical fashion.

Here are some ideas:

Clean it up - Remove trash and scrap material by placing them in the proper receptacles. Return unnecessary tools, equipment, and supplies to their proper locations. Establish a system for keeping trash and clutter cleaned up on each work shift.

Arrange your work area - Use a logical sequence to save unnecessary steps. Ensure the supplies and tools you use most often are within reach. Items used less frequently should be placed further away. Arrange your tools and supplies so you can move smoothly from one stage of the activity to the next.

Comfort - Adjust the height of your chair or stool, and desk or bench for maximum comfort and efficiency. If you are sitting down, your knees should be slightly higher than your hips -- use a footrest if necessary. If you are standing or sitting at a high stool, have a footrest available so you can put one foot up. This eases the strain on your back.

Check the lighting - It should be bright enough to see the work. There should be adequate contrast of light and shadow to see clearly. Adjust window coverings and light sources to remove glare from computer screens and shiny work surfaces.

Have a Safety Idea!
Submit it to the Safety Office (MS 429).
We Listen to Safety.

Ergonomic Evaluators At LaRC

Name	Phone	Name	Phone
Atkins, Nannette	48159	Lane, Marie	44578
Carmine, Michael	44667	Merritt, Kim	43210
Carras, Deborah	49850	Quinn, Chip	48743
Chavis, Jackie	49601	Richardson, Sherry	43848
Curtis, Lynn	45449	Russell, Henry	46795
Garrison, Leroy	47241	Ruth, Donald	43562
Good, Chuck	48107	Smith, Lloyd	43356
Goodman, Wes	45725	Smith, Tom	47427
Hart, Robert	43169	Wagner, Woody	43434
Hathaway, Dick	49425	Walker, Shannon	42458
Hoagland, Manna	49677	Walter, Jennifer	826-9033
Jarrils, Kathleen	46288	Watkins, Lucy	43438
Johnson, K.C.	49408	Whitaker, Mark	43065
Johnston, Roger	43208	Williams, Patricia	44775
Kirby, Jeff	42639	Zeitman, Chuck	43371
Kjeldsen, Pete	44356		

For additional information or assistance, call the Safety and Facility Assurance Office (SFAO) Industrial Hygienist (IH) Staff

- Patricia Cowin (48664)
- Carter Ficklen (43205)
- Roger Johnston (43208)

or call 4SAFE (47233).

NASA Safety

At LaRC
Safety's First!

Ergonomics

What is Ergonomics?

Ergonomics involves the application of knowledge about human capacities and limitations to the design of workplaces, equipment, tools, jobs, tasks, and the environment. Simply, ergonomics is fitting the workplace to the worker.

Don't Run Away, Yet. At Least Open Me!

Ergonomic Goals at LaRC

- Create ergonomically correct working environments to reduce the occurrence of musculoskeletal disorders (MSDs) at LaRC
- Train personnel to recognize ergonomic stressors in their work areas
- Further strengthen our Voluntary Protection Program(VPP) Status
- Comply with directives NPR 1800.1, NPR 8715.1, and NPR 8715.3

affecting the body's muscles, tendons, ligaments, joints, or spinal disks. Also known as work-related musculoskeletal disorders, repetitive strain injuries, cumulative trauma, overuse injuries and other names, these injuries are generally caused by repetitive work. MSDs can lead to loss of strength, loss of range of motion, loss of muscle function, and loss of ability to do ordinary tasks.

Common symptoms of MSDs:

- Painful joints
- Pain, tingling, numbness in hands or feet
- Shooting or stabbing pains in the arms or legs
- Swelling or inflammation
- Burning sensation
- Pain in the wrists, shoulders, forearms, or knees
- Fingers or toes turning white
- Back or neck pain
- Stiffness

What do you do if you experience these symptoms?

- Stop what you are doing!
- Contact your health care provider.
- Have your work station evaluated for ergonomic stressors (see list of evaluators on back of tri-fold).
- Implement corrective actions.

Position/Posture

Good position/posture maximizes strength and comfort which decreases the risk of injury due to dynamic movements. A few of these movements are bending, twisting, and over-extension of the body. How do I identify good posture? If your body is relaxed and supporting itself, BINGO!

Repetition

Repetition is when an employee performs the same task over and over again. Constant motion using the same muscles causes fatigue failure to occur on the body.

Newton's Second Law
F=ma
F=force m=mass a=acceleration

Force

When force is applied to a particular area, the result is the formation of stresses in that area. Parts in a machine fail due to stress and so will your body. The human body may seem like the perfect machine, but it's still a machine. Therefore, like all machines, the greater the force, the greater the stress, and a greater risk of failure, which will result in MSDs.

Duration

"How long can you go?" Not exactly the question to answer when working on a job-site. The better question is "How long can you go without subjecting your body to possible MSDs?" Take a minute to ask this question the next time you're on the job. Taking a "micro-break" will break the cycle you're currently working in and will reduce the risk of developing a MSDs.

The "Significant Seven" Ergonomic Stressors

Compression

Is a result of leaning or pressing against hard, sharp edge, or corner surfaces. The more weight (Force) applied against the area of the object, the greater the compression stress, which results in a greater chance of developing MSDs.

Vibration

The body doesn't like to shake, rattle, and roll no matter what your teenager at home tries to tell you. Employees in contact with vibrating machines (whether they're holding or sitting on them) will experience muscle fatigue and overall failure. This is because the body is constantly trying to adjust itself to the vibrating motion.

Temperature

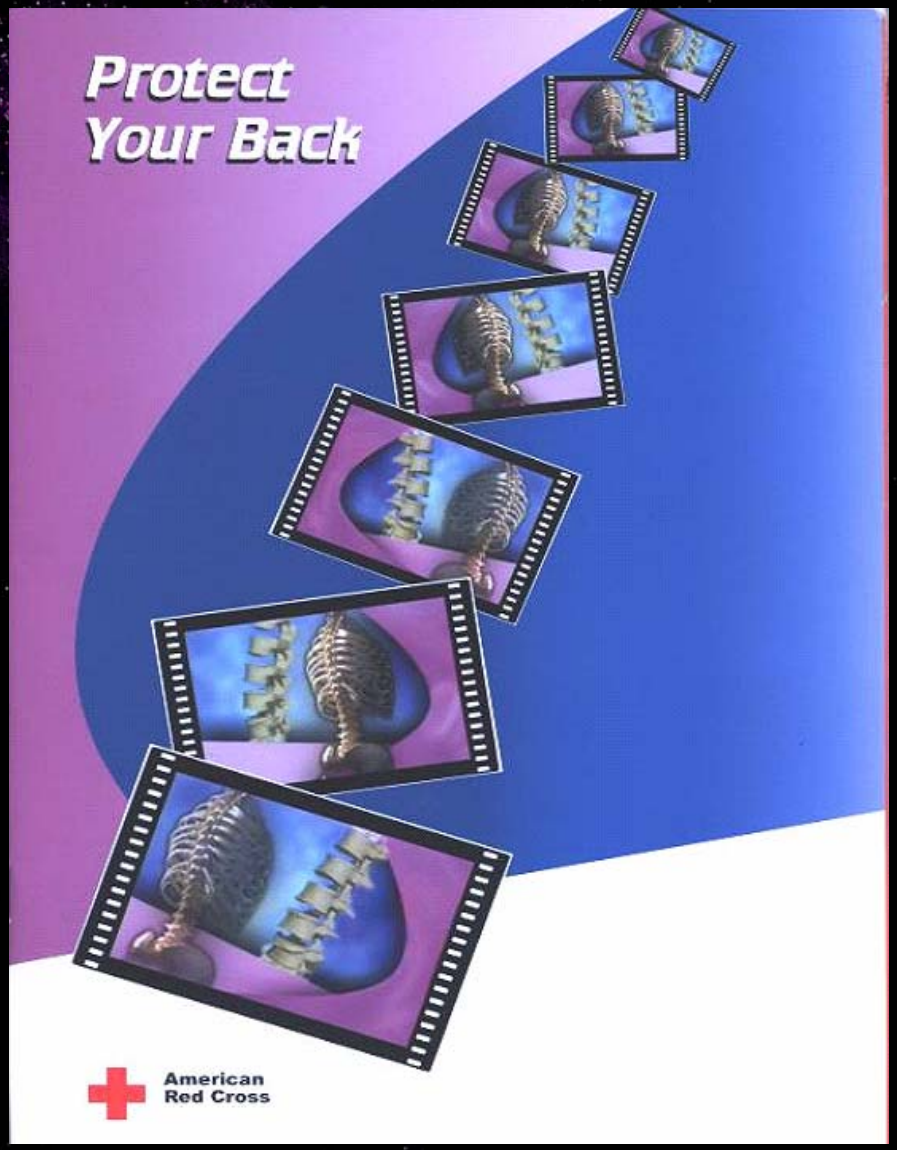
Do you feel like going outside and working in shorts and a T-shirt on a cold, winter day? NO! The reason you feel cold is that your body is reducing blood flow to it's extremities to keep the torso warm. This reduction in blood flow also increases your risk of developing MSDs.

Contact the Safety Office (4-SAFE) with any questions about the "Significant Seven".

Have A Safe Day!

Implementation

- Launched program during SSDD June 2004
  - “Introduction to Ergonomics” slides provided to supervisors for presentation to employees
  - Back safety/lifting safety presentations by the Hampton American Red Cross



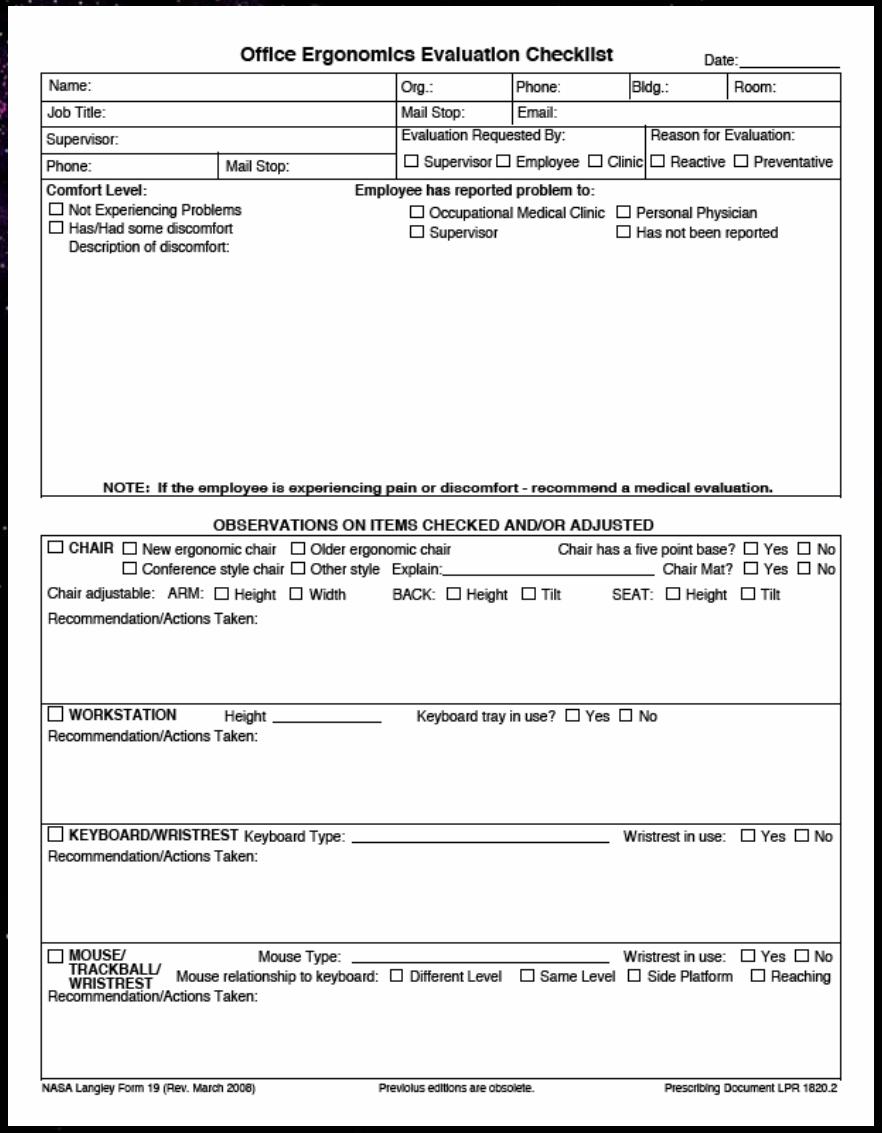
Ergo Evaluators

- 26 evaluators from various organizations and levels throughout the Center
  - Supervisors/Secretaries
  - Technicians/Engineers
- Hundreds of evaluations conducted to date
  - Primarily office evaluations
  - Some industrial worksites

Langley Form (LF)19

LF 19 Office Ergonomics Evaluation Checklist

- Memory jogger for evaluators
- Communicates findings to:
  - Employee
  - Supervisor
  - Health Clinic
  - Safety Office



Office Ergonomics Evaluation Checklist Date:_____

Name:	Org.:	Phone:	Bldg.:	Room:
Job Title:	Mail Stop:	Email:		
Supervisor:	Evaluation Requested By: ☐ Supervisor ☐ Employee ☐ Clinic		Reason for Evaluation: ☐ Reactive ☐ Preventative	
Phone: / Mail Stop:				

Comfort Level:
☐ Not Experiencing Problems
☐ Has/Had some discomfort
Description of discomfort:

Employee has reported problem to:
☐ Occupational Medical Clinic ☐ Personal Physician
☐ Supervisor ☐ Has not been reported

NOTE: If the employee is experiencing pain or discomfort - recommend a medical evaluation.

OBSERVATIONS ON ITEMS CHECKED AND/OR ADJUSTED

☐ **CHAIR** ☐ New ergonomic chair ☐ Older ergonomic chair Chair has a five point base? ☐ Yes ☐ No
☐ Conference style chair ☐ Other style Explain:_____ Chair Mat? ☐ Yes ☐ No
Chair adjustable: ARM: ☐ Height ☐ Width BACK: ☐ Height ☐ Tilt SEAT: ☐ Height ☐ Tilt
Recommendation/Actions Taken:

☐ **WORKSTATION** Height _____ Keyboard tray in use? ☐ Yes ☐ No
Recommendation/Actions Taken:

☐ **KEYBOARD/WRISTREST** Keyboard Type: _____ Wristrest in use: ☐ Yes ☐ No
Recommendation/Actions Taken:

☐ **MOUSE/ TRACKBALL/ WRISTREST** Mouse Type: _____ Wristrest in use: ☐ Yes ☐ No
Mouse relationship to keyboard: ☐ Different Level ☐ Same Level ☐ Side Platform ☐ Reaching
Recommendation/Actions Taken:

NASA Langley Form 19 (Rev. March 2008) Previous editions are obsolete. Prescribing Document LPR 1820.2

Training

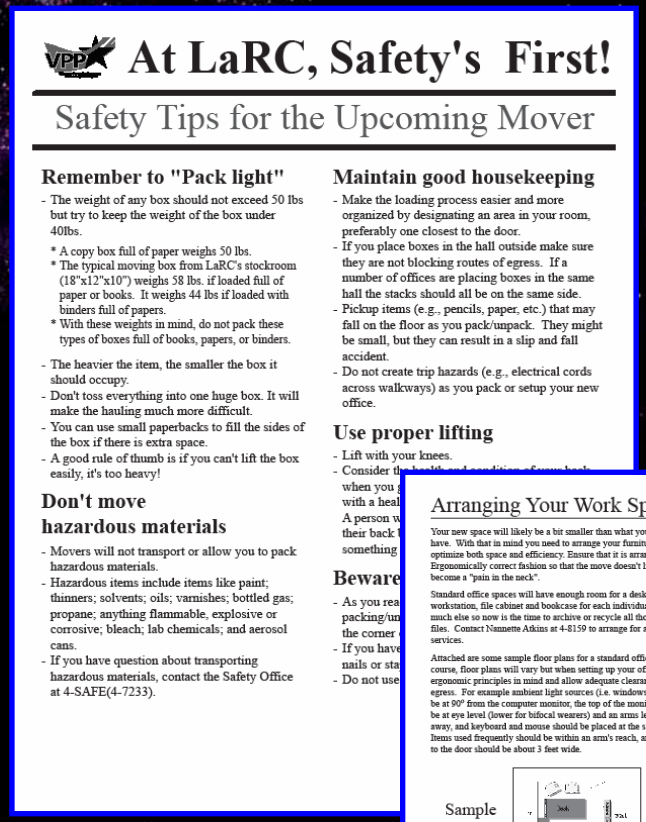
The average age among LaRC Civil Servants is 47.6 years.

Two thirds (66%) of LaRC Civil Servants are 45 or older.

AIHA Teleweb course on Ergonomics and the Aging workforce provided to Ergo Evaluators

Additional Activities

- Employee training offered during SSDD/SAW/SHAW and upon request
- Developed and distributed, to all employees, a moving tips flyer in advanced of the Center building consolidation moves.



At LaRC, Safety's First!

Safety Tips for the Upcoming Mover

Remember to "Pack light"

- The weight of any box should not exceed 50 lbs but try to keep the weight of the box under 40lbs.
  * A copy box full of paper weighs 50 lbs.
  * The typical moving box from LaRC's stockroom (18"x12"x10") weighs 58 lbs. if loaded full of paper or books. It weighs 44 lbs if loaded with binders full of papers.
  * With these weights in mind, do not pack these types of boxes full of books, papers, or binders.
- The heavier the item, the smaller the box it should occupy.
- Don't toss everything into one huge box. It will make the hauling much more difficult.
- You can use small paperbacks to fill the sides of the box if there is extra space.
- A good rule of thumb is if you can't lift the box easily, it's too heavy!

Don't move hazardous materials

- Movers will not transport or allow you to pack hazardous materials.
- Hazardous items include items like paint; thinners; solvents; oils; varnishes; bottled gas; propane; anything flammable, explosive or corrosive; bleach; lab chemicals; and aerosol cans.
- If you have question about transporting hazardous materials, contact the Safety Office at 4-SAFE(4-7233).

Maintain good housekeeping

- Make the loading process easier and more organized by designating an area in your room, preferably one closest to the door.
- If you place boxes in the hall outside make sure they are not blocking routes of egress. If a number of offices are placing boxes in the same hall the stacks should all be on the same side.
- Pickup items (e.g., pencils, paper, etc.) that may fall on the floor as you pack/unpack. They might be small, but they can result in a slip and fall accident.
- Do not create trip hazards (e.g., electrical cords across walkways) as you pack or setup your new office.

Use proper lifting

- Lift with your knees.
- Consider th… when you … with a heal… A person w… their back … something …

Beware

- As you rea… packing/un… the corner …
- If you have … nails or sta…
- Do not use …

Arranging Your Work Space

Your new space will likely be a bit smaller than what you currently have. With that in mind you need to arrange your furniture to optimize both space and efficiency. Ensure that it is arranged in an Ergonomically correct fashion so that the move doesn't literally become a "pain in the neck".

Standard office spaces will have enough room for a desk, computer workstation, file cabinet and bookcase for each individual but not much else so now is the time to archive or recycle all those old files. Contact Nannette Atkins at 4-8159 to arrange for archival services.

Attached are some sample floor plans for a standard office. Of course, floor plans will vary but when setting up your office keep ergonomic principles in mind and allow adequate clearances for egress. For example ambient light sources (i.e. windows) should be at 90° from the computer monitor, the top of the monitor should be at eye level (lower for bifocal wearers) and an arms length away, and keyboard and mouse should be placed at the same level. Items used frequently should be within an arm's reach, and the path to the door should be about 3 feet wide.

Sample 1

Sample 2

Need Help with Office Layout?

Contact an Ergo Evaluator from the list below. A proper work environment is the key to settling into a new office.

Layout Tidbits:

For work stations. One size doesn't fit all.

Your workspace is like your castle. You should be able to do your job. Without any hassle!

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Safety

Packing Guide and Tips

Write on the master list the contents of the numbered boxes. Make a box of essentials and label it "Open Me First."

Number boxes when they are packed and sealed, write your name and room destination on each box.

Get smaller boxes for books. Use bigger boxes for lighter items.

Get more boxes than you think you will need.

Reinforce the bottom of boxes with at least one strip of packing tape.

Pack boxes firmly to prevent the contents from shifting during your move.

Seal boxes tightly with wide packing tape.

Use crumpled paper for padding.

Separate items with paper to prevent scratches caused by rubbing.

Place heavier items in the bottom of the box and lighter items on top.

Additional Activities

- Employee training offered (almost) annually
  - SSDD 2004 Introduction to Ergonomics
  - SAW 2006 Online Ergonomics Training
  - SHAW 2007 Office Ergonomics
  - SHAW 2008 Ergo & the Aging Workforce
- and upon request
  - Housekeeping staff, Back Safety
  - ODIN Refresh team, Computer Workstation Setup
  - FTA employees, Back Injury Prevention

Impact?

- RSIs
  - 2005 -2008 17% of injuries
  - 2001-2004 15% of injuries