

ERGONOMICS DEMONSTRATION PROJECT

Update

Utilities

January 2002



INTRODUCTION

Health & Safety personnel in the utility industry know that utility workers incur many serious work-related musculoskeletal disorders (WMSD's). A group of people representing electric, gas, and water utility companies from the western U.S. formed to address common musculoskeletal problems found within their industry. They met quarterly to brainstorm and share ideas for ergonomic solutions. Since Washington State adopted the ergonomics rule, the group realized the need to do job analyses to identify caution zone jobs and hazard zone jobs. Despite having multi-state membership, the group saw benefit for all members by working together to address the Washington rule. A demonstration project was initiated in April 2001. The project has emphasized and encouraged the use of caution zone job/hazard zone job checklists for many jobs. A component method of assessment was developed to address the more difficult types of jobs with high task variability.

The demonstration project for utilities is in progress with plans for completion later in 2002. At the present time, samples of completed Caution Zone Checklists for common utility jobs follow. The related hazard level assessments for those identified caution zone jobs will be available in the near future. Data collection using a component method of assessment intending to provide exposure rates for highly variable jobs is in process. Results are pending.

PRELIMINARY RESULTS

The following completed Caution Zone Checklists are provided by members of the Western Utilities Ergonomics Group for job positions found in the utility industry. The jobs were identified as caution zone jobs (CZJ's) or not, based on the range of tasks typically performed by workers with these job titles and their exposure to the 14 physical risk factors listed in the Washington ergonomics rule. Activities or items that contributed to its caution zone job status are included in the each comment section.


These CZJ checklists are examples that can provide guidance regarding what to look out for or what might be expected at other facilities (or for similar jobs outside of the utility industry). However, the distribution of tasks and duration of tasks may be markedly different for different employers. Each employer will still need to make some determination as to whether the completed checklist well represents the job classifications at their own facilities. As an illustration, if employees at another utility spend minimal time doing the activities listed in the comment section so that the exposure time is much smaller, the job would not be a CZJ even if the sample CZJ Checklist suggests otherwise. Additionally, if at the other utility, employees perform other activities or use items that increase the exposure, these also will need to be considered for the CZJ determination.


Job Title: Heavy equipment mechanic (Fleet)	Employer: Tacoma Power
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Caution Zone Checklist (WAC 296-62-05105) Use one sheet for each position evaluated.


Movements or postures that are a regular and foreseeable part of the job, occurring more than one day per week, and more frequently than one week per year.	If done in this job position <input checked="" type="checkbox"/> the box	Job Position evaluated: Date: 5/16/01	No. of employees in these jobs? 4
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Awkward Posture Comments/Observations


 1. Working with the hand(s) above the head, or the elbow(s) above the shoulders more than 2 hours total per day.	NO	
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 2. Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day.	<input checked="" type="checkbox"/> YES	Welding
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 3. Squatting more than 2 hours total per day.	NO	
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 4. Kneeling more than 2 hours total per day.	NO	
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High Hand Force Comments/Observations

 5. Pinching an unsupported object(s) weighing 2 or more pounds per hand, or pinching with a force of 4 or more pounds per hand, more than 2 hours per day (comparable to pinching half a ream of paper).	NO	
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 6. Gripping an unsupported objects(s) weighing 10 or more pounds per hand, or gripping with a force of 10 or more pounds per hand, more than 2 hours total per day (comparable to clamping light duty automotive jumper cables onto a battery).	<input checked="" type="checkbox"/> YES	assorted hand tools
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Job Title: Heavy equipment mechanic (Fleet)		Comments/Observations
Highly Repetitive Motion		
	7. Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds, more than 2 hours total per day.	NO
	8. Performing intensive keying more than 4 hours total per day.	NO
Repeated Impact		
	9. Using the hand (heel/base of palm) or knee as a hammer more than 10 times per hour, more than 2 hours total per day.	NO
Heavy, Frequent or Awkward Lifting (A simple scale can be used to determine the weight of materials)		
	10. Lifting object weighing more than 75 pounds once per day or more than 55 pounds more than 10 times per day.	✓ YES
	11. Lifting objects weighing more than 10 pounds if done more than twice per minute, more than 2 hours total per day.	NO
	12. Lifting objects weighing more than 25 pounds above the shoulders, below the knees or at arms length more than 25 times per day.	NO
Moderate to High Hand- Arm Vibration (Closely estimate or obtain the vibration value of the tool in use)		
	13. Using impact wrenches, carpet strippers, chain saws, percussive tools (jack hammers, scalers, riveting or chipping hammers) or other tools that typically have high vibration levels, more than 30 minutes total per day.	✓ YES
	14. Using grinders, sanders, jigsaws or other hand tools that typically have moderate vibration levels more than 2 hours total per day.	✓ YES

Comments/Observations

Highly Repetitive Motion

Comments/Observations

Repeated Impact

Heavy, Frequent or Awkward Lifting (A simple scale can be used to determine the weight of materials)

Comments/Observations

manual lifting of transmissions, assembled tires/wheels occur even when there are transmission jacks and tire dollies available

Comments/Observations

Impact wrenches, air ratchets


Sanders, grinders, and drills


Job Title: Mechanic (Fleet)	Employer: Tacoma Power
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Caution Zone Checklist (WAC 296-62-05105) Use one sheet for each position evaluated.


Movements or postures that are a regular and foreseeable part of the job, occurring more than one day per week, and more frequently than one week per year.	If done in this job position <input checked="" type="checkbox"/> the box	Job Position evaluated: Date: 6/13/01	No. of employees in these jobs? 8
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Awkward Posture **Comments/Observations**


 <p>1. Working with the hand(s) above the head, or the elbow(s) above the shoulders more than 2 hours total per day.</p>	NO	
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 <p>2. Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day.</p>	MAYBE	More likely if the job requires a lot of welding
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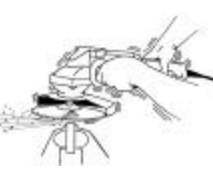
 <p>3. Squatting more than 2 hours total per day.</p>	NO	
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 <p>4. Kneeling more than 2 hours total per day.</p>	NO	
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High Hand Force **Comments/Observations**

 <p>5. Pinching an unsupported object(s) weighing 2 or more pounds per hand, or pinching with a force of 4 or more pounds per hand, more than 2 hours per day (comparable to pinching half a ream of paper).</p>	NO	
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 <p>6. Gripping an unsupported objects(s) weighing 10 or more pounds per hand, or gripping with a force of 10 or more pounds per hand, more than 2 hours total per day (comparable to clamping light duty automotive jumper cables onto a battery).</p>	<input checked="" type="checkbox"/> YES	Impact wrenches, air ratchet wrenches, hand tools
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Job Title: Mechanic (Fleet)		Comments/Observations
Highly Repetitive Motion		
	7. Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds, more than 2 hours total per day.	NO
	8. Performing intensive keying more than 4 hours total per day.	NO
Repeated Impact		
	9. Using the hand (heel/base of palm) or knee as a hammer more than 10 times per hour, more than 2 hours total per day.	NO
Heavy, Frequent or Awkward Lifting (A simple scale can be used to determine the weight of materials)		
	10. Lifting object weighing more than 75 pounds once per day or more than 55 pounds more than 10 times per day.	✓ YES
	11. Lifting objects weighing more than 10 pounds if done more than twice per minute, more than 2 hours total per day.	NO
	12. Lifting objects weighing more than 25 pounds above the shoulders, below the knees or at arms length more than 25 times per day.	MAYBE
Moderate to High Hand- Arm Vibration (Closely estimate or obtain the vibration value of the tool in use)		
	13. Using impact wrenches, carpet strippers, chain saws, percussive tools (jack hammers, scalers, riveting or chipping hammers) or other tools that typically have high vibration levels, more than 30 minutes total per day.	✓ YES
	14. Using grinders, sanders, jigsaws or other hand tools that typically have moderate vibration levels more than 2 hours total per day.	✓ YES

starters and tires weighing > 55 pounds; radiators, and brake drums

tires

impact wrenches, air ratchets, and air scrapers


Grinders, sanders, air scalers in fabrication shop


Job Title: Warehouse worker (wire room)	Employer: Seattle City Light
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Caution Zone Checklist (WAC 296-62-05105) Use one sheet for each position evaluated.


Movements or postures that are a regular and foreseeable part of the job, occurring more than one day per week, and more frequently than one week per year.	If done in this job position <input checked="" type="checkbox"/> the box	Job Position evaluated: Date: 11/31/01	No. of employees in these jobs? 8
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Awkward Posture **Comments/Observations**


 <p>1. Working with the hand(s) above the head, or the elbow(s) above the shoulders more than 2 hours total per day.</p>	NO	
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 <p>2. Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day.</p>	NO	
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 <p>3. Squatting more than 2 hours total per day.</p>	NO	
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 <p>4. Kneeling more than 2 hours total per day.</p>	NO	
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High Hand Force **Comments/Observations**









 <p>5. Pinching an unsupported object(s) weighing 2 or more pounds per hand, or pinching with a force of 4 or more pounds per hand, more than 2 hours per day (comparable to pinching half a ream of paper).</p>	NO	
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 <p>6. Gripping an unsupported object(s) weighing 10 or more pounds per hand, or gripping with a force of 10 or more pounds per hand, more than 2 hours total per day (comparable to clamping light duty automotive jumper cables onto a battery).</p>	NO	
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Job Title: Warehouse worker (wire room)		Comments/Observations
Highly Repetitive Motion		
	7. Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds, more than 2 hours total per day.	NO
	8. Performing intensive keying more than 4 hours total per day.	NO
Repeated Impact		
	9. Using the hand (heel/base of palm) or knee as a hammer more than 10 times per hour, more than 2 hours total per day.	NO
Heavy, Frequent or Awkward Lifting (A simple scale can be used to determine the weight of materials)		
	10. Lifting object weighing more than 75 pounds once per day or more than 55 pounds more than 10 times per day.	YES ✓
	11. Lifting objects weighing more than 10 pounds if done more than twice per minute, more than 2 hours total per day.	NO
	12. Lifting objects weighing more than 25 pounds above the shoulders, below the knees or at arms length more than 25 times per day.	NO
Moderate to High Hand- Arm Vibration (Closely estimate or obtain the vibration value of the tool in use)		
	13. Using impact wrenches, carpet strippers, chain saws, percussive tools (jack hammers, scalers, riveting or chipping hammers) or other tools that typically have high vibration levels, more than 30 minutes total per day.	NO
	14. Using grinders, sanders, jigsaws or other hand tools that typically have moderate vibration levels more than 2 hours total per day.	NO

coils of pre-cut wire; lifting coils of wire on/off coiling machine or hand truck; making hand coils or placing them in stock. (manual material handling equip. is used in the warehouse for most other heavy items.)

Job Title: Utility serviceworker (water meter reader)		Employer: City of Everett	
Caution Zone Checklist (WAC 296-62-05105) Use one sheet for each position evaluated.			
Movements or postures that are a regular and foreseeable part of the job, occurring more than one day per week, and more frequently than one week per year.	If done in this job position ✓ the box	Job Position evaluated: Water Meter Reader Date: 4/12/01	No. of employees in these jobs? 3
Awkward Posture		Comments/Observations	
 1. Working with the hand(s) above the head, or the elbow(s) above the shoulders more than 2 hours total per day.	NO	No exposure	
 2. Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day.	NO	Exposure less than 2 hours/day	
 3. Squatting more than 2 hours total per day.	NO	Exposure less than 2 hours/day	
 4. Kneeling more than 2 hours total per day.	NO	Exposure less than 2 hours/day	
High Hand Force		Comments/Observations	
 5. Pinching an unsupported object(s) weighing 2 or more pounds per hand, or pinching with a force of 4 or more pounds per hand, more than 2 hours per day (comparable to pinching half a ream of paper).	NO	No exposure	
 6. Gripping an unsupported object(s) weighing 10 or more pounds per hand, or gripping with a force of 10 or more pounds per hand, more than 2 hours total per day (comparable to clamping light duty automotive jumper cables onto a battery).	NO	Worker holds handheld datalogger for about 3 hours/day, but does not have to use a forceful grip. Generally, it rests on the palm, not gripped. There is a handstrap, which pretty much keeps the data logger snug to the hand	

Job Title: Utility serviceworker (water meter reader)		Comments/Observations
Highly Repetitive Motion		
	7. Repeating the same motion with the neck, shoulders, elbows, wrists, or hands (excluding keying activities) with little or no variation every few seconds, more than 2 hours total per day.	NO Exposure less than 2 hours/day
	8. Performing intensive keying more than 4 hours total per day.	NO No exposure
Repeated Impact		
	9. Using the hand (heel/base of palm) or knee as a hammer more than 10 times per hour, more than 2 hours total per day.	NO No exposure
Heavy, Frequent or Awkward Lifting (A simple scale can be used to determine the weight of materials)		
	10. Lifting object weighing more than 75 pounds once per day or more than 55 pounds more than 10 times per day.	NO Manhole covers weigh about 50 pounds and are lifted less than once/day
	11. Lifting objects weighing more than 10 pounds if done more than twice per minute, more than 2 hours total per day.	NO No exposure
	12. Lifting objects weighing more than 25 pounds above the shoulders, below the knees or at arms length more than 25 times per day.	NO No exposure
Moderate to High Hand- Arm Vibration (Closely estimate or obtain the vibration value of the tool in use)		
	13. Using impact wrenches, carpet strippers, chain saws, percussive tools (jack hammers, scalers, riveting or chipping hammers) or other tools that typically have high vibration levels, more than 30 minutes total per day.	NO No exposure
	14. Using grinders, sanders, jigsaws or other hand tools that typically have moderate vibration levels more than 2 hours total per day.	NO No exposure

Description:

Everett has 84,000 residents in a 29 square mile area. Utility serviceworkers read approximately 5000 water meters monthly, 70% of those are residential meters. The remaining customers are billed at a flat rate. The utility serviceworker has a daily route of 300 meters reads, grouped by address. The City of Everett dedicates one full-time employee to meter reading, and other employees assist as needed to meet the billing schedule.

Residential water meters are in a small below ground vault, generally near the property line. The process involves opening the vault cover, visualizing the meter, entering the reading in a handheld data collector and closing the cover, optimally requiring less than 30 seconds per meter. Variations and complications include clearing access to the vault, clearing debris from the meter inside the vault, handwriting meter readings if data collector is not available, walking vs. driving between meters, flashlight needed for low light and larger vaults with heavier covers.

The work process will be changing soon. By the end of 2002, most water meters in Everett will be read by driving past the meter and picking up radio signals rather than manually opening the vault lids and reading the meters.

Tools

- 18" flathead screwdriver
- clipboard & pen
- handheld data logger
- Chevy S-10 small truck