CNC Reservoir – Case Study

Background

The CNC operator is responsible for maintaining the CNC reservoir level for seven CNC machines at the appropriate fill level. No injuries had occurred; however, employees reported significant physical strain with the manual handling method. Production quality had not been affected yet. The Operators were performing the task as they had been trained to perform it. They performed other tasks with less than 50% of the time on their feet throughout the shift.

Tasks

The task involves:

- Filling empty five gallon buckets with a hose to about 75% full
  - Based on 8#/gallon, each bucket weighs approximately 30#
  - Two buckets weigh 60# total
- Picking up and carrying two buckets at a time a distance of 100 feet for a duration of about 30 to 40 seconds for the carrying/handling component
- Tipping the bucket into the CNC reservoir one bucket at time

Depending on the level of use, each of the CNC machines requires*:

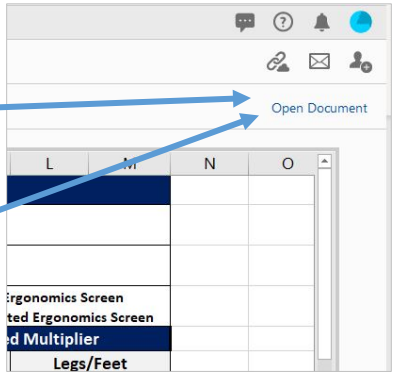
- Two buckets of fluid 1 to 3 times weekly
- For the worst case, this would be about 8 buckets/day
- About 2 to 3 minutes of total carrying/handling time per day.

**Seven CNC machines times 6 buckets/machine/week equals 42 buckets/week. In a five day workweek about 8 buckets/day carried two at a time for a total of 3 trips/day of about 30 to 40 seconds of actual carrying/handling time for a total per day of about 2 to 3 minutes.*

Ergonomics Risk Screen

Open ERS Spreadsheet

Please open the Excel file ***Ergonomics Risk Screen 11-0.xlsx*** found in the ***ERGOM Session Two Homework Participant Portfolio.pdf.*** To do this, click on the Excel Icon on the left side to access the file and then click on **Open Document** in the right upper corner to open the file in Excel. Save the file with a unique name.



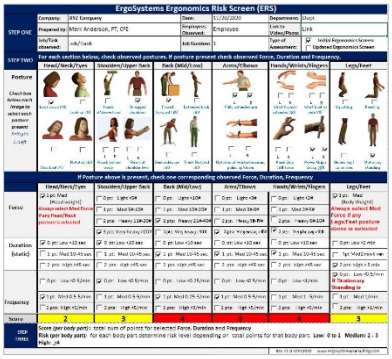
Video Clip - Before

Please access the ***CNC Reservoir Before.mpg*** video clip found in the ***ERGOM Session Two Homework Participant Portfolio.pdf.***

To play the video click on **Open Document** in the right upper corner.

Complete the ERS

Complete the ERS, refer to the ***Ergonomics Risk Screen – Tutorial*** in the manual for additionally instructions as needed.



Video Clip – After

Play the video clip, ***CNC Reservoir After.mpg*** to see what the actual ergonomics intervention consisted of.

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Fill out ERS Worksheet

Based on your completed ERS answer the questions on the ERS Worksheet and submit.

ERS Worksheet Questions

1. From Step Two check the *Postures* you observed

Head/Neck/ Eyes	Shoulders/ Upper Back	Back (Mid/Low)	Arms/Elbows	Hands/ Wrists/ Fingers	Legs/Feet
☑ Look down	☐ Hands at/ above head	☑ Flexed forward	☐ Fully extended arm	☐ Wrist flexed/ extended	☑ Squatting
☐ Look up	☑ Shrugged shoulders	☐ Extended back	☐ Rotation of wrists/ forearms	☐ Wrist bent to side	☐ Kneeling
☐ Side bent	☐ Reach behind body	☐ Bent sideways		☐ Pinch grip	☐ On one leg/ up on toes
☐ Rotated	☐ Reach at shoulder level	☐ Trunk rotated		☑ Power grip	☐ Stationary standing

2. From Step Two check the *Force* you observed

Head/Neck/ Eyes	Shoulders/ Upper Back	Back (Mid/Low)	Arms/Elbows	Hands/ Wrists/ Fingers	Legs/Feet
☑ 1 pt	☐ 0 pt	☐ 0 pt	☐ 0 pt	☐ 0 pt	☑ 1 pt
	☐ 1 pt	☐ 1 pt	☐ 1 pt	☐ 1 pt	
	☐ 2 pts	☐ 2 pts	☐ 2 pts	☐ 2 pts	
	☑ 3 pts	☑ 3 pts	☐ 3 pts	☑ 3 pts	

3. From Step Two check the *Duration (Static)* you observed

Head/Neck/ Eyes	Shoulders/ Upper Back	Back (Mid/Low)	Arms/Elbows	Hands/ Wrists/ Fingers	Legs/Feet
☐ 0 pt	☐ 0 pt	☐ 0 pt	☐ 0 pt	☐ 0 pt	☑ 0 pt
☑ 1 pt	☑ 1 pt	☑ 1 pt	☐ 1 pt	☑ 1 pt	☐ 1 pt
☐ 2 pts	☐ 2 pts	☐ 2 pts	☐ 2 pts	☐ 2 pts	☐ 2 pts

4. From Step Two check the *Frequency* you observed

Head/Neck/ Eyes	Shoulders/ Upper Back	Back (Mid/Low)	Arms/Elbows	Hands/ Wrists/ Fingers	Legs/Feet
☐ 0 pt	☐ 0 pt	☐ 0 pt	☐ 0 pt	☐ 0 pt	☐ 0 pt
☑ 1 pt	☑ 1 pt	☑ 1 pt	☐ 1 pt	☑ 1 pt	☑ 1 pt
☐ 2 pts	☐ 2 pts	☐ 2 pts	☐ 2 pts	☐ 2 pts	☐ 2 pts

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5. From Step Two check the *Time Weighted Multiplier* you observed

Head/Neck/ Eyes	Shoulders/ Upper Back	Back (Mid/Low)	Arms/Elbows	Hands/ Wrists/ Fingers	Legs/Feet
☑ 1 hr or less (0.75)	☑ 1 hr or less (0.75)	☑ 1 hr or less (0.75)	☑ 1 hr or less (0.75)	☑ 1 hr or less (0.75)	☑ 1 hr or less (0.75)
☐ 1 to 2 hrs (1.0)	☐ 1 to 2 hrs (1.0)	☐ 1 to 2 hrs (1.0)	☐ 1 to 2 hrs (1.0)	☐ 1 to 2 hrs (1.0)	☐ 1 to 2 hrs (1.0)
☐ 2 to 4 hrs (1.25)	☐ 2 to 4 hrs (1.25)	☐ 2 to 4 hrs (1.25)	☐ 2 to 4 hrs (1.25)	☐ 2 to 4 hrs (1.25)	☐ 2 to 4 hrs (1.25)
☐ 4 + hrs (1.5)	☐ 4 + hrs (1.5)	☐ 4 + hrs (1.5)	☐ 4 + hrs (1.5)	☐ 4 + hrs (1.5)	☐ 4 + hrs (1.5)

6. From Step Four check the *Other Factors* you observed

☐ Production/Quality	☑ Equipment	☐ Ambient lighting too low
☐ Training	☐ Fixture/Jig	☐ Ambient lighting too high
☐ Vibration – hand/arm	☐ Workstation	☐ Task lighting
☐ Vibration – whole body	☐ Foot support	☐ Vision
☐ Hot Environment	☐ Controls	☐ Foot Controls
☐ Cold Environment	☐ Tools	
☐ On feet > 50% of shift	☐ Chair	
☑ Contact Stress (sharp/hard)	☐ Display	
	☑ Work surface height - too low/high	

7. **From Step Six check the IDEAL *Corrective Action* you would recommend** (not limited by budget or time constraints)
   - ☐ Smaller buckets
   - ☐ Rotate workers
   - ☐ Get a cart
   - ☑ Add water supply

8. **From Step Six check the COST EFFECTIVE *Corrective Action* you would recommend** (consideration of cost to implement and overall Operator exposure to the job demands)
   - ☐ Smaller buckets
   - ☐ Rotate workers
   - ☑ Get a cart
   - ☐ Add water supply