**ErgoSystems Ergonomics Risk Factor Analysis (Post-Intervention)**

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| **STEP ONE** | **Company:** | ABC Company, Inc. | **Date:** | 2/6/2012 | **Department/****Work Unit:** | Machine Center |
|  | **Prepared by:** | Mark Johnson | **Time:** | 10:00 AM | **Safety FYIs/ Injury History:** | 3 FYIs, 0 incidents |
| **Job/Task Observed:** | Fill CNC Reservoirs, 5 gal buckets, 75 to 100 feet, fill each of 7 CNC 1 to 3/week | **# People Affected:** | 3 | **Employees Observed:** | Amy Sedon |

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| **STEP TWO** | **Head/Neck/Eyes** | **Shoulders/Upper Back** | **Back (Mid/Low)** | **Arms/Elbows** | **Hands/Wrists/Fingers** | **Legs/Feet** |
| **Posture** | E:\body_postures\neck\07102.jpg | E:\body_postures\neck\07105.jpg | E:\tasks_actions\lift_carry_reach\10124.jpg | E:\body_postures\shoulder\02107.jpg | E:\tasks_actions\lift_carry_reach\10115.jpg | E:\body_postures\trunk\01105.jpg | E:\body_postures\shoulder\02104.jpg | E:\body_postures\wrist\08102.jpg | E:\body_postures\wrist\08104.jpg |  | kneeling.jpg |
| E:\body_postures\wrist\08101.jpg | E:\body_postures\wrist\08105.jpg |
| E:\body_postures\neck\07103.jpg | E:\body_postures\neck\07108.jpg | E:\tasks_actions\lift_carry_reach\10108.jpg |  | E:\body_postures\trunk\01103.jpg | E:\body_postures\trunk\01108.jpg | prno sup.jpg | E:\tasks_actions\hand\06102.jpg | E:\tasks_actions\hand\06103.jpg | E:\tasks_actions\lift_carry_reach\10146.jpg |  |
| [x]  Look down > 300[ ]  Look up > 100[ ]  Side bent > 150[ ]  Rotated > 200 | [ ]  Hands at/above shoulders/head[ ]  Shrugged shoulders[ ]  Reach behind body | [x]  Flexed forward >200[ ]  Extended back > 200[ ]  Bent sideways > 200[ ]  Rotated >200 | [ ]  Fully extended arm[ ]  Rotation of wrists/forearms, palms up/down | [ ]  Wrist flex/extend > 20o[ ]  Wrist bent to side > 15o[ ]  Pinch grip[x]  Power grip | [x]  Squatting [ ]  Kneeling[ ]  On one leg/up on toes |
| **Force** | 0 | Light: < 5# | 0 | Light: < 5# | 0 | Light: < 10# | 0 | Light: < 3# | 0 | Light: < 2# | 0 | Light: < 20# |
| **1** | Mod: 5# to 10# | 1 | Mod: 5# to 10# | 1 | Mod: 10# to 20# | 1 | Mod: 3# to 8# | 1 | Mod: 2# to 5# | **1** | Mod: 20# to 40# |
| 2 | Heavy: 10# to 20# | 2 | Heavy: 10 # to 20# | **2** | Heavy: 20# to 40# | 2 | Heavy: 8# to 15# | 2 | Heavy: 5# to 10# | 2 | Heavy: 40# to 60# |
| 3 | Very Heavy: > 20# | 3 | Very Heavy: >20# | 3 | Very Heavy: >40# | 3 | Very Heavy: >15# | **3** | Very Heavy: >10# | 3 | Very Heavy: >60# |
|  **Duration (static)** | **0** | Low: < 10 sec | 0 | Low: < 10 sec | **0** | Low: < 10 sec | 0 | Low: < 10 sec | **0** | Low: < 10 sec | **0** | Low: < 10 sec |
| 1 | Mod: 10 to 45 sec | 1 | Mod: 10 to 45 sec | 1 | Mod: 10 to 45 sec | 1 | Mod: 10 to 45 sec | 1 | Mod: 10 to 45 sec | 1 | Mod: 10 to 45 sec |
| 2 | High: > 45 sec | 2 | High: > 45 sec | 2 | High: > 45 sec | 2 | High: > 45 sec | 2 | High: > 45 sec | 2 | High: > 45 sec |
| **Frequency** | **0** | Low: < 0.5/min  | 0 | Low: < 0.5/min | **0** | Low: < 0.25/min | 0 | Low: < 0.5/min | **0** | Low: < 1/min | **0** | Low: < 0.5/min |
| 1 | Mod: 0.5 to 5/min | 1 | Mod: 0.5 to 5/min | 1 | Mod: 0.25 to 3/min | 1 | Mod: 0.5 to 5/min | 1 | Mod: 1 to 5/min | 1 | Mod: 0.5 to 3/min |
| 2 | High: > 5/min | 2 | High: > 5/min | 2 | High: > 3/min | 2 | High: > 5/min | 2 | High: > 5/min | 2 | High: > 3/min |

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| **STEP THREE** | **Score *(per body part)*:** total number of checked boxes for **Posture** plus sum of numbers circled for **Force**, **Duration** and **Frequency****Risk *(per body part)* :** for each body part determine risk level depending on the total points for that body part: **Low**: 0 to 2, **Mod**: 2 to 4, **High** > 5 |
| **Score** | 2 | ***LL* *L*M  LHL** | 0 | ***LL* LM LHL** | 3 | **LL *LM* LHL** | 0 | **L*L* LM LHL**  | 4 | **LL *LM* *LHL*** | 2 | **L *L* LM LHL** |

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| **STEP FOUR** | **Other Factors** | **YES** | **NO** |  | **STEP FIVE** | **Discomfort Survey/Employee Input** |
| **Production/Quality** – Work processes affected negatively | [ ]  | [ ]  |  | **Complete survey based on average workday.**Indicate left and right side using Key below: | **Employee Comments:*** Reported significant decrease in discomfort in back, hands, arms and shoulders when using cart to transport buckets between fill station and reservoir at the CNC machines.
* No longer have to bend down when using hose to fill the buckets.
* Have to pick up bucket and dump into reservoir.

***NOTE***: Scores are average of 3 individuals completing the Discomfort Survey. |
| **Training** – Inadequate safety or process training | [ ]  | [ ]  | **0= NONE/MINIMAL:** Some discomfort, able to reasonable cope while performing general tasks |
| **Vibration** – Of hand/arm, related to tool use (grinders, sanders, etc.) | [ ]  | [ ]  | **1=MODERATE:** Moderate discomfort, some difficulty in performing general activities. |
| **Vibration** – Of whole body, related to driving vehicles (fork trucks, etc.) | [ ]  | [ ]  | **2=SEVERE:** Significant difficulty in performing general activities. |
| **Temperature/Hot** – Exposure to hot environments | [ ]  | [ ]  |  | **3=MAX:** Maximum discomfort (unable to function, admitted to the hospital.) |
| **Temperature/Cold** – Exposure to cold environments | [ ]  | [ ]  |  |

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| **Body Part** | **Left**  | **Right**  |
| 1. **Head/Neck/ Eyes**
 | 0 | 0 |
| 1. **Shoulders/ Upper Back**
 | 0 | 0 |
| 1. **Back (Mid/Low)**
 | 1 | 1 |
| 1. **Arms/Elbows**
 | 0 | 0 |
| 1. **Hands/Wrists/ Fingers**
 | 0 | 1 |
| 1. **Legs/Feet**
 | 0 | 0 |
| **Left (** 1 ) **+ Right (** 2 ) **= (** 3 ) |

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| **Contact Stress** –Hard surface pressure on body from sitting or standing | [ ]  | [ ]  |  |
| **Contact Stress** – Sharp edge pressure on body from workbench, tool, etc. | [x]  | [ ]  |  |
| **Tools** – Incorrect tool or tool used incorrectly | [ ]  | [ ]  |  |
| **Task lighting** – Inadequate task light for inspection  | [ ]  | [ ]  |  |
| **Ambient lighting** – Too low or too high level of ambient lighting | [ ]  | [ ]  |  |
| **Vision** – Difficulty in seeing parts/materials to assemble or inspect | [ ]  | [ ]  |  |

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| **STEP SIX** | **Total Score** |  | **STEP SEVEN** | **Action Plan** |
| **Head/Neck/Eyes** | 2 |  |

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| **Corrective Action** | **Responsible Person(s)** | **Due Date** | **Status** |
| Obtain cart to position and transport buckets from fill station to CNCs. Cart needs to be able to position bucket at knee level and easy to maneuver. | Mark Johnson | 8/12/2011 |

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| [ ]  | **Not Started** |
| [ ]  | **In Process** |
| [x]  | **Completed** |

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| [ ]  | **Not Started** |
| [ ]  | **In Process** |
| [ ]  | **Completed** |

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| **Shoulders/Upper Back** | 0 |  |
| **Back (Mid/Low)** | 3 |  |
| **Arms/Elbows** | 0 |  |
| **Hands/Wrists/Fingers** | 4 |  |
| **Legs/Feet** | 2 |  |
| **Other Factors** | 1 |  |
| **Discomfort Survey** | 3 |  |
| **TOTAL SCORE****SCORING KEY: LOW: 0 to15 MOD: 16 to 30 HIGH: > 30**  | **15** |  |

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| **CURRENT MAJOR STEPS** | **ERGONOMICS ISSUES** | **POTENTIAL SOLUTIONS** |
| Place empty 5 gallon buckets (2) on floor | None |  |
| Fill buckets 75% full with filler hose | Out-of-neutral posture (bend over) to handle hose to fill buckets Goal: Reposition buckets to allow neutral body position when filling buckets with hose | OPTIONS:1. Plumb each CNC reservoir (cost factor)
2. Obtain cart to position buckets on the cart at a level to allow neutral body position (20” from the floor)
 |
| Pick up 2 buckets (one in each hand) by bucket handle and carry to CNC machine. Distance: 75 to 125 feet. Bucket weight: each at 30# | Ineffective work processManual handling of heavy load (evident physical strain)Goal: reduce/eliminate significant physical strain | OPTIONS:1. Plumb each CNC reservoir
2. Use long hose to reach to each CNC, will require up to 125’ of hose
3. Obtain cart to transport buckets
 |
| At CNC machine set bucket down on floorPick up each bucket and manually pour into CNC reservoir  | Ineffective work processManual handling of heavy load (evident physical strain)Goal: reduce/eliminate significant physical strain | OPTIONS:1. Plumb each CNC reservoir
2. Use long hose
3. Obtain cart to maintain buckets in power lift zone and provide a base of support when tipping the bucket contents into the reservoir
 |
| Return empty buckets to storage area (located by the filler hose) | None |  |
| **MISC NOTES**1. No injuries had occurred; however employees reported significant physical strain with the manual handling method
2. Seven (7) CNC machines are operated, depending on use each may be filled 1 to 3 times weekly. Approximately one bucket is used to fill the reservoir at each machine.
 |
| **FOLLOW-UP** |
| Based on overall review (including level of use, cost analysis to implement various solutions and employee input) cart was obtained (Little Giant with two swivel and two fixed 8” wheels with handle on swivel wheel end. Cart platform height is 20”.)Cart was purchased for $300.00; employees received training in use of the cart.Follow-up at 1, 3 and 6 month intervals indicated excellent employee acceptance with significant decrease in reported discomfort and decreased risk of injury. |