

Beckett Air Inc., Ridgeville

Intervention Key Words: Automation, Torque tester, Blower Wheels, Impellers, HVAC, Stamping, Assembly

Industrial Key Words: Manufacturing

Risk Factor(s): Awkward Postures-Shoulders and Wrists deviations, Repetitive motion, High Hand Force-Pinching/Gripping

Situation:

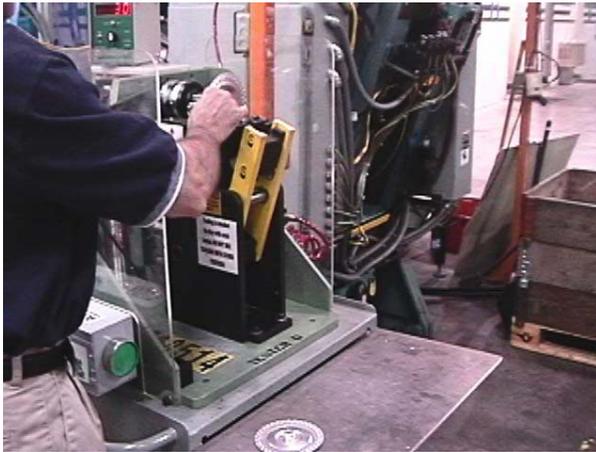
Beckett Air is one of the largest manufacturers of metal blower wheels in the United States. Their use ranges from HVAC applications to hand held blow dryers. Each component of the blower wheels are stamped in power presses and then assembled through a number of steps. During each production run, numerous quality checks are performed on the completed wheels to evaluate the strength of the hub-backplate attachment, two parts necessary to maintain the integrity of the wheel. These checks are run by placing the assembled wheel in a typical bench vise and implement a torque wrench to measure the shear strength of the attachment. The torque required to maintain acceptable quality is referred to as “breakaway torque” and can range from 13 to 53 lbs.-ft. When testing the breakaway torque of the blower wheel, an employee manually applies this force to the wrench. The repetitive nature of the task, along with the high amount of force used creates a risk for Cumulative Trauma Disorders (CTDs) affecting the shoulders, elbows, and wrists.



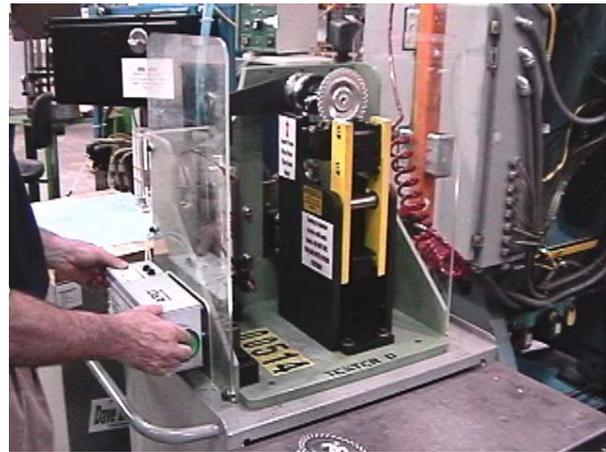
Manual torqueing required for quality control

Solution:

To eliminate the strain placed on employees who perform the manual torque checks on the blower wheels, Beckett Air designed and implemented 8 mechanical torque testers (Total Cost: \$88,988). The task of the worker has been reduced from securing the wheel in a vise and using the torque wrench to simply setting the sample in the new tester. The CTD risks involved with the vice and the wrench have been removed. The intervention affects 67% of the 120 total Beckett Air employees and was made possible by a \$40,000 grant awarded by the Safety Grant\$ program.

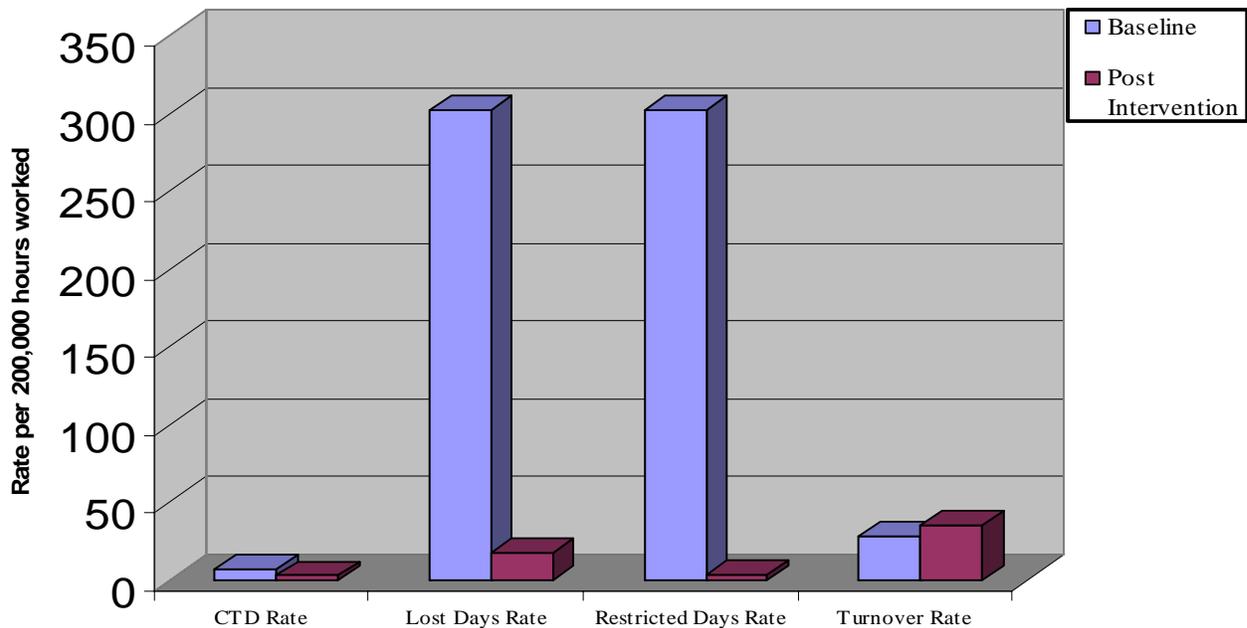


Insertion of blower wheel

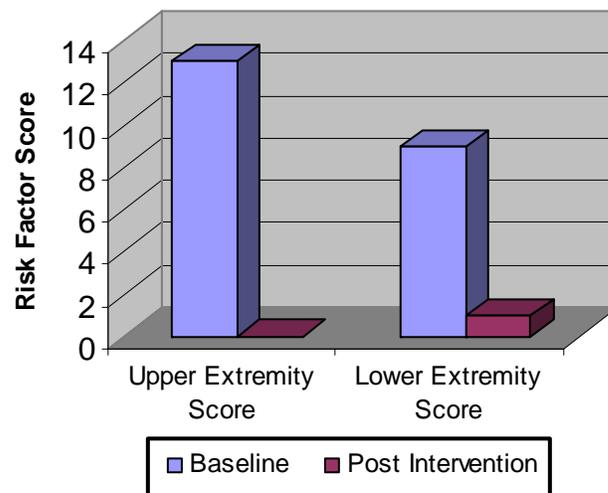


Operation of Mechanical Torque Tester

Results:



- CTD rate decreased from 6.6 to 2.4 injuries per 200,000 hours worked, a 64% improvement.
- Lost Days and Restricted Days were reduced 94% and 99% respectively when measured standardized 200,000 hours worked



- Upper Extremity Risk Factor scores improved 100% while Lower Extremity scores improved 89%
- Productivity was measured by the time saved through the use of the new intervention as compared to the old method. The calculated time savings at the end of 24 months was 660.6 hours per year
- Quality (% wheels not passing torque test): Before: 0.2718%
After: 0.0020%

This equates to 2718 parts per million (ppm) failing before intervention compared to only 20 ppm failing afterwards, a 99.3% improvement.