

Rob Strickland, OTR

Ergonomics Consulting

27422 SE Division Drive
Gresham, Or. 97030
503-667-3564

Ergonomic Post-Project Evaluation

**AccessAbility
Panel Mover
September 2001
By Rob Strickland, OTR**

An on site ergonomic evaluation of the use of the new Panel Mover device was completed on September 14, 2001. A video tape and still photos were taken during the evaluation and are available for review. A post-project discomfort survey was completed by Gail Schmidt, (owner and the only employee at present).

Purpose/Background:

The purpose of this evaluation is to provide an assessment and documentation of the improvements in the musculo-skeletal disorder (MSD) risk factors associated with the use of the new Panel Mover.

Observations/conclusions:

The Panel Mover is the engineering control designed and built for this project. It consists of overhead rail tracks with a trolley, chain binder and panel holding end device to lift and move the panels throughout the shop. There is also a simple tilt table device which enables panels to be transferred to a flat, horizontal position for notching and painting. The new process involves the following steps:

1. Position panel mover end device under bottom edge of 4' X 8' sheet of 3/4" plywood and secure with clamp on top
2. Pull down on the handle of chain binder (requiring up to 20 pounds of downward force) from 78" to 57" (vertical location of handle) to lift panel clear of storage position
3. Push or pull panel with end device and trolley along overhead rail (requiring 8-15 pounds of force) to position panel in panel saw
4. Align panel in saw and cut to prescribed dimensions (same process as before)
5. Reposition and re-attach panel end device to panel and lift/move as in step 3 to tilt table device
6. Lower panel (with chain hoist handle) to tilt table, move panel end device out of the way
7. Pull down on tilt table handle (requiring 12 to 24 pounds of downward force from 61" to 34" (vertical height of handle) to orient the panel flat
8. Use saber saw to cut notches in corners and end of panel (same process as before)
9. Paint edges and upper surface with roller
10. Release tilt table handle to lower panel back to vertical position
11. Reposition and re-attach panel end device to panel and lift/move to temporary storage in shop

12. After paint has dried, steps 5-11 are repeated to paint the back side of panel. Then after final drying, the panel mover is used to return panels to storage

There are presently six sets of chains and panel end devices allowing for six panels to be processed as described above.

MSD Risk factor assessment: All of the primary MSD risk factors have been reduced or eliminated-

1. Forces and loads have largely been eliminated by use of the panel mover and tilt table i.e. no lifting is required. Minimal pushing, pulling and pulling down, is now used to manipulate and transport the panels.
2. Awkward postures are reduced significantly by use of the panel mover and tilt table. Any remaining non-neutral positions of the trunk or upper extremities takes place without additional load or with gravity assist (body weight assists with pulling down on handles of chain binder and tilt table).
3. Contact stresses of plywood edges against soft tissues of hands have been minimized by reducing the load (weight) of panel that is handled.

Worksite Redesign Project Completion Summary

The reduction in risk factors identified above, combined with the discomfort survey results indicate that the engineering controls instituted by the new panel mover, tilt table and related processes have been very successful. The MSD risk factors have been substantially reduced and safety has been enhanced. Ms. Schmidt reports that overall productivity of processing and handling plywood panels remains essentially the same using the Panel Mover and Tilt Table, but is done with much lower expenditure of energy and with much greater physical comfort. She expresses very high satisfaction in the over-all outcome of the engineering improvements.

Employee Discomfort Survey Summary

Ms. Schmidt reported discomfort levels in the pre-project discomfort survey (on the 0 to 10 scale) as follows: Lower back- 8, abdominals- 6, neck, shoulders, upper back all rated 4, elbows, forearms, knees all rated 3, hand & wrist rated 2. Following the introduction of the panel mover and tilt table, the post-project discomfort survey indicated a rating of 0 (no discomfort) related to the panel moving tasks. One can conclude based on the results of the pre and post ergonomic assessments along with the pre and post-project discomfort surveys that the initial MSD risk factors found in the panel moving process have been significantly reduced by the engineering controls and ergonomic improvements implemented under the Worksite Redesign Grant Project.

Overhead Rail Tracks for Panel Mover provides for lateral movement of panels throughout the shop



Panel Mover End Device hanging on chain binder suspended from chain and trolley



Using Panel Mover to place panel into the Tilt Table device



Using the Tilt Table to place the panel flat for notching and painting by pulling down on the handle



Panel in flat position



For further assistance or questions regarding this report please contact Rob Strickland, (503) 667-3564.

Respectfully,

Rob Strickland, OTR
Ergonomics Specialist