What’s New in Ergonomic Assist Devices

Sponsored by: E.A.S.E. Council

Speaker: James J. Galante Southworth Products
• Non Profit Trade Association
• Established 1945
• Members include 650+ Manufacturers

E.A.S.E. Ergonomic Assist Systems and Equipment
A Product Council of Material Handling Industry of America
Manual Material Handling problems?

OR

Material Handling opportunities through applied ergonomics?
LIFTING
STRETCHING
REACHING
BENDING
STOOPING
and
WALKING

These unnecessary worker activities can result in low productivity, worker fatigue, and costly job-related injuries.
LIFTING

- Reaching and lifting to load/unload pallets
- Awkward back extension to access the far side
- Difficult and improper grip to the load or parts
- Bending over and twisting associated to the manual tasks
Pallets

MANUAL LOADING AND UNLOADING OF PALLETS CONTINUES TO BE ONE OF THE MOST COMMON AND MOST INJURY PRONE TASKS IN INDUSTRY TODAY
OOh... I hate my job!

...Don't like my boss much either!

Wasted time
Wasted energy
Likely injury
These are automatic load leveling devices that maintain the top of the load in the 30 to 38” ergonomic window
Sitting or standing a lift can eliminate the back bending to associated with pallet loading/unloading.

This lift is portable.
Balancers can also be used to unload pallets and make positioning goods at various locations within a machine or work center. Notice the bi-directional work station crane.

These trays of parts become virtually "weightless".
Lifts and positioners can also be fitted with turntables for “near side” loading.

As much as 40% of the time required loading a pallet, can be spent walking around it!
TIME SAVINGS = 40%
WORK REDUCTION = 75%

Gosh.. I love my job!

MY BOSS IS A GREAT GUY!

SUBSTAINTAIL REDUCTION IN LOST TIME INJURIES!
• **Access to bottom of container is poor**
• **Reach over limits bending of the legs which exaggerates back strains**
• **Reaching to the far back and bottom causes back extension**
Manual loading and unloading of wire baskets, containers and Gaylord's leads to a high incidence of lower back injuries.
Repetitive bending into containers can result in a high incidence of back injuries.
Parts picking at a hydraulic press work station

Imagine the back extension, bending and reaching required to get to these parts
This is a "Lift and Tilt" giving the operator direct control of vertical and angular positions.

This is a completely pneumatic machine.
Work station lifts to eliminate back bending & stretching

These lifts tilt as they rise vertically
Parts picking made productive from fixed height tilters

Notice the high hinge causing the container to elevate as it tilts
Parts Picking in Work Cells

There is a scissors lift to position the assembly.

These container tilters are portable.
WHAT TO LOOK FOR ...

- Workers needing to squat, reach, and stretch to gain access to work.
- Large work pieces that require operation on more than one surface.
- Any repetitious assembly tasks.
- Work stations with stepstools or extension arms for tools.
- Equipment with access/adjustment near floor.
- Heavy work pieces that must be moved or positioned.
- Production machines that require high volume input or output.
- Work stations modified by employee to make work easier.
- Material that shouldn’t be touched by hand (hot, cold, food, etc.)
This vacuum lifter makes easy lifting and maneuvering of these heavy cheese wheels.

This is a really cheesy job!
Manipulators making easy work of handling cylinder heads in a machining center
Manipulators can be suspended from a simple boom or from articulated arms to give the operator a full range of motion.
Electric chain hoist on articulated jib crane

Notice the use of gravity roller conveyor to ease the feeding of parts
Work station crane to feed heavy components within a machining center

Note this is a free standing structure
This expandable conveyor is driven right into the truck

The individual boxes and cartons are conveyed right to the worker

Notice how the odd sizes and shapes are handled easily by a single piece of equipment
Lift with 90 Degree Upender for Assembly of large panels
Portable lift for vertical positioning panels in a finishing operation
Lift & Tilt to position electrical panels in this work cell

Notice the accordion skirting to cover scissors legs
Manipulators to handle things to **hot** to handle ...
...or lifters to manipulate the small stuff
IAD - Intelligent Assist Devices

Amplifies operator’s power
   Unit has an intuitive, human-like feel

Intuitive
   The operator has a sense of control & feel over the load using normal arm, wrist and hand movements.

Intelligent
   Resolver feedback from the servomotor allows for future implementation of programmable human limits.
IAD Principles of Operation

Machine Reaction Force
Sensors

sense → process → actuate

Operator Motion/Force

Human

IAD
From raising people, to put them where the work is, to...
... putting the work in a proper position in front of people, so they can work more efficiently, like this portable positioner or ...
...or this adjustable height assembly bench

Notice the back stand shelving and light bar
This is a portable stacker which works well in many work station applications. They can be equipped with platforms or forks to handle a variety of loads, containers or pallets. This unit can transport the load to and from the work cell.
Parts picking on assembly line
This lift and gravity conveyor permits one person to do what was a two man job.
This portable die cart is inexpensive, fast and effective.

Notice the docking clips where the cart and the rack interface.
...so from pulling parts where lifts need to have wheels, to ...
...to positioning really **big** material

...that has it own wheels...
...to the **REALLY BIG** machines that need to have their wheels installed.
NAH!

Just kidding!
A Multi-Media Tool for Material Handling Problems
The Ergonomics Toolbox was ... 

Designed As a Multimedia Soft Tool for Practitioners -- It Is Not Directed to the Research Community!
A Software in 4 Parts

Introduction to Ergonomics  |  Ergonomic Hazards  |  Task Evaluation and Assessment  |  Equipment Recommendation

A multi-media tool for identifying, analyzing and implementing ergonomic solutions for material handling problems
Part I Provides Definitional Information & Justification of Ergonomics

- Background information is provided to justify ergonomics programs

- Interventions methods are defined:
  
  Administrative & Engineering
Part 2  Provides a Visual Definition of Ergonomic Terms

- Video shorts of MMH tasks
- MMH task can become ergonomic hazards:
  - excess repetitions
  - excess force
  - poor posture & environment
Part 3 Is the Ergonomic Task Evaluator

- User selects “problem task” from MMH study areas
- Data is drawn from the leading publications in ergonomics
- Hazards are flagged and “what-if” corrective scenarios can be rapidly investigated
Part 4  Proposes Integrated Ergonomic Solution

- Describes generic ergonomic equipment

- Takes system task descriptions and provides illustrations of potential integrated solutions to proactively address workplace design
That’s the E.A.S.E. Council’s Ergonomics Toolbox
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