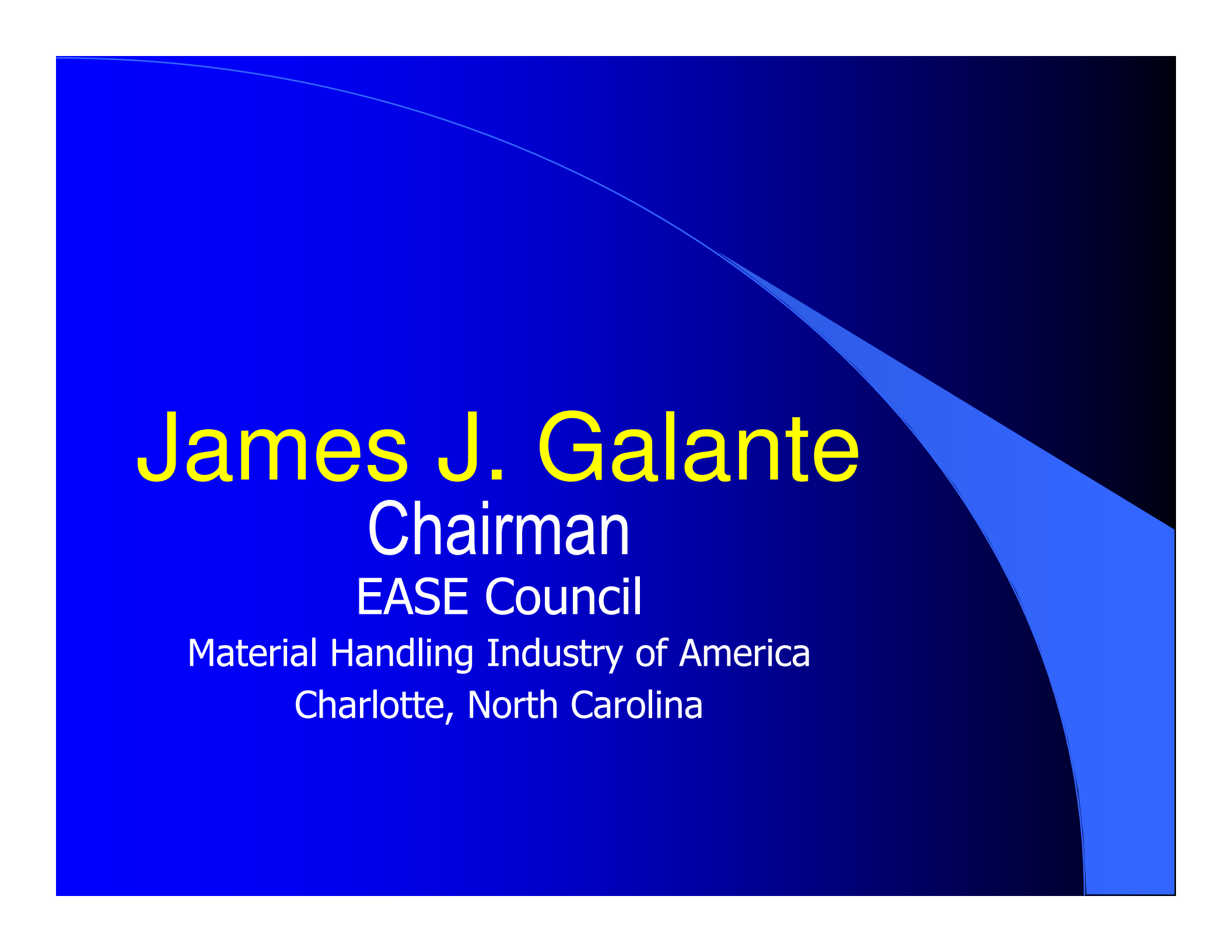


# Ergonomics and Manual Material Handling



**James J. Galante**

Chairman

EASE Council

Material Handling Industry of America

Charlotte, North Carolina



***E.A.S.E.*** Ergonomic Assist  
Systems and Equipment

A Product Council of Material Handling Industry of America





Established 1945

Non-profit Trade Assoc.

\$125 Billion Market

19 Industry Groups

Over 750 Members

22 ANSI Standards

Two Major Trade Shows

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17 Member Companies

5 Industries Covered

Ergonomic Resources and Tools

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Material Handling  
Equipment Distributors  
Association

[www.MHEDA.org](http://www.MHEDA.org)

# MISSION

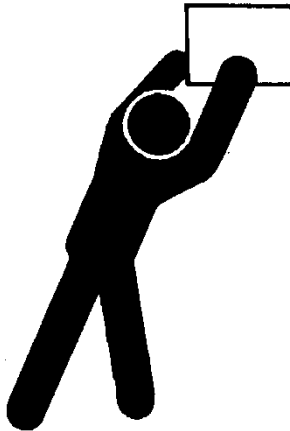
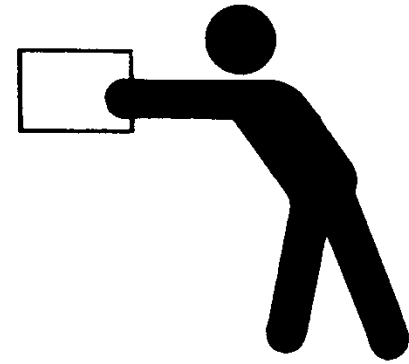
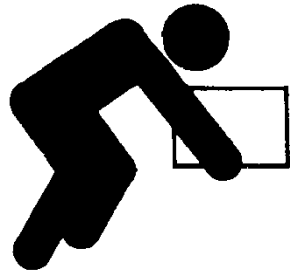
To broadly promote the benefits of ergonomic assist systems and equipment together with the advantages derived from the use of this equipment in the workplace and to promote the safety and health of the work environments.

The background is a solid blue gradient that transitions from a lighter blue on the left to a darker blue on the right. A thin, light blue curved line starts near the top left and arcs across the upper portion of the slide. The text is centered in the lower half of the slide.

# **Why Address Manual Material Handling?**

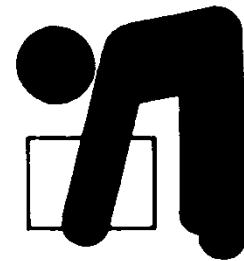
*The effects of manual material handling represent the biggest single contributor to worker injury in the United States and the application of good ergonomic programs can reduce those incidences.*

**LIFTING  
STRETCHING  
REACHING  
BENDING  
STOOPING**



**and**

**WALKING**



**These unnecessary worker activities  
can result ergonomic problems**



# Lift & Turn to position large valves during assembly



Turntable



The assembly, wiring start-up and testing of these large devices requires access to all sides, top and bottom







Vacuum lifters are efficient and very useful in areas where sorting containers is creating multiple pick and place tasks

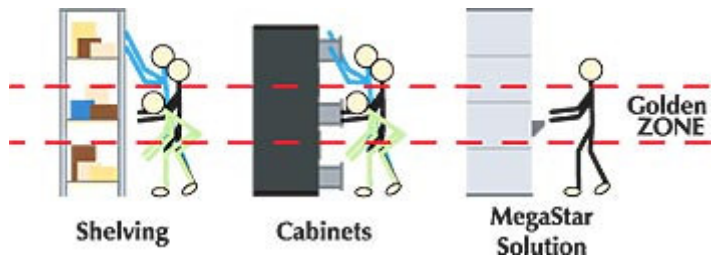
Bench top  
devices like  
this  
adjustable  
height stand  
or this  
turntable allow  
complete  
access to the  
work while  
seated or  
standing







High density vertical storage systems put each item at the correct height





Manipulators making easy work of handling cylinder heads in a machining center



# IAD - Intelligent Assist Devices



## Amplifies operator's power

Unit has an intuitive, human-like feel

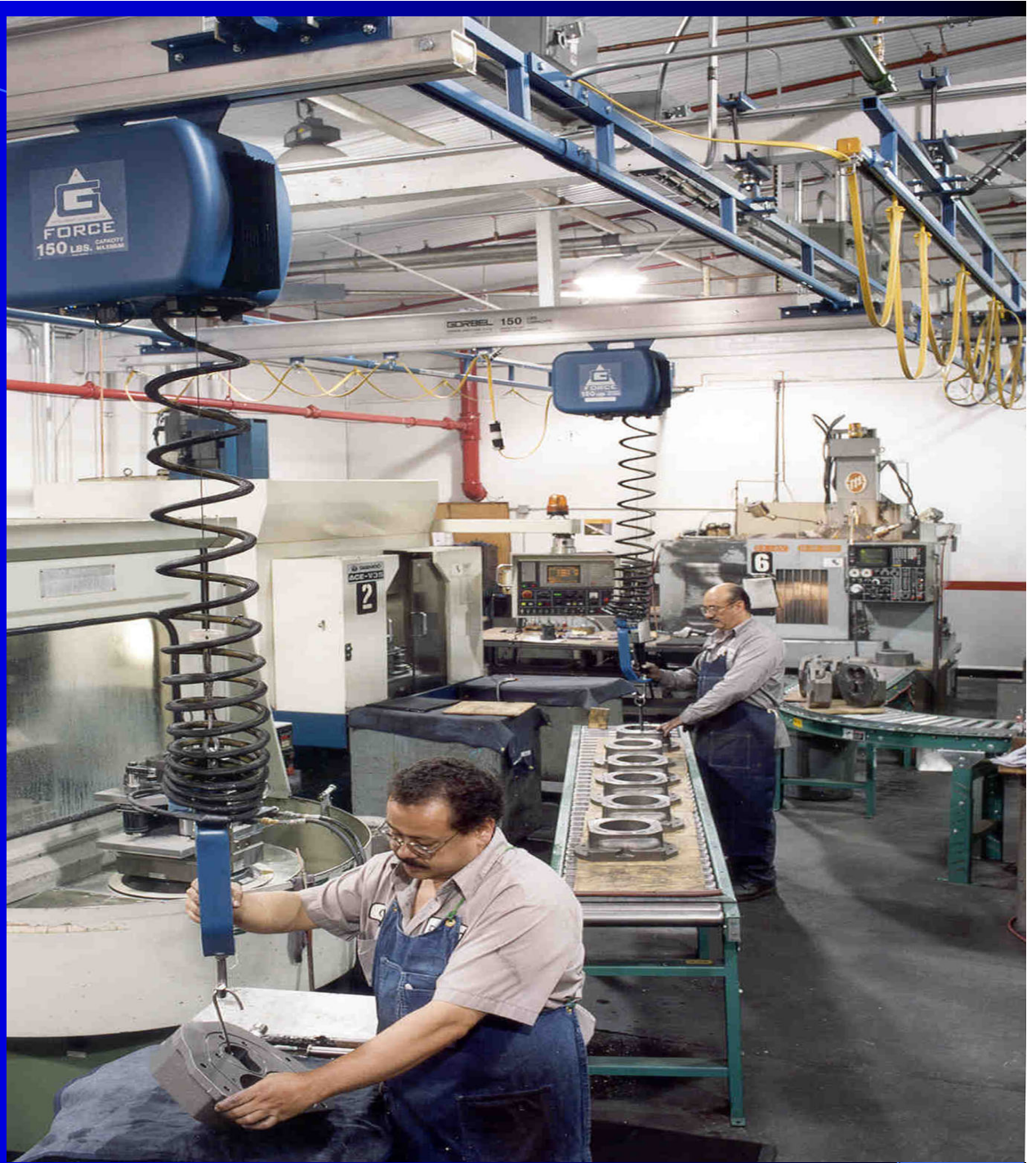
## Intuitive

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

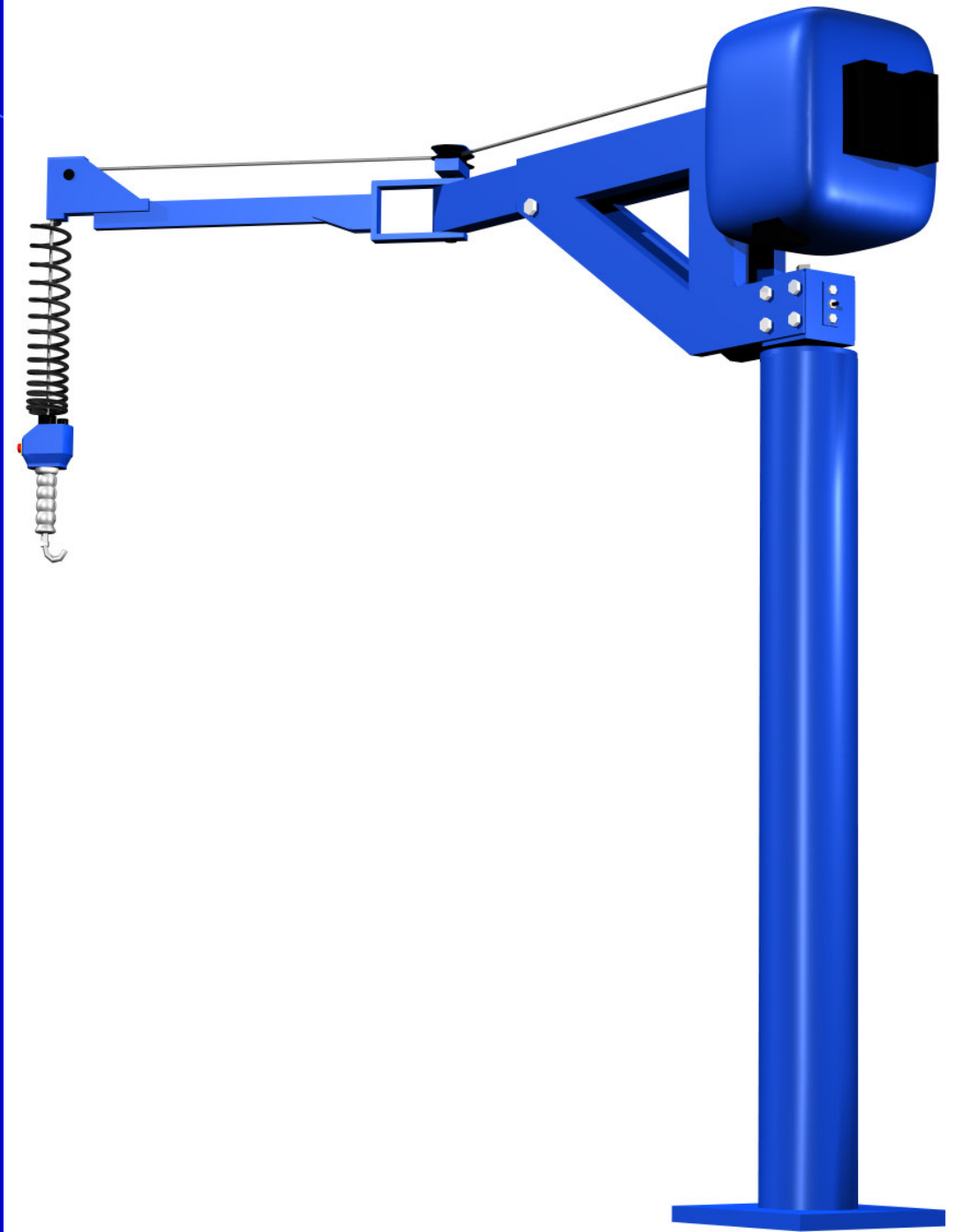
## Intelligent

Resolver feedback from the servomotor allows for future implementation of programmable human limits.

IAD's for  
vertical  
movement



IAD's for  
Horizontal  
movement



These manual devices reduce carrying loads







They come in all shapes and sizes and to gain the maximum benefit should applied to the application



Some care should be used  
not to overload carts



This lift and gravity conveyor permits one person to do what was a two man job



# Pallets

Approximately 450 million new pallets produced each year in the USA. 1.4 billion (est'm) pallets are in use at any given time.



**MANUAL LOADING AND UNLOADING  
OF PALLETS CONTINUES TO BE  
ONE OF THE MOST COMMON AND  
MOST INJURY PRONE TASKS  
IN INDUSTRY TODAY**





Here is a very typical problem





These are automatic load leveling devices that maintain the top of the load in the 30 to 40" ergonomic window



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!

Lifts fitted with  
turntables eliminate  
wasted motion....



....and put the load at  
the right elevation to  
reduce the possibility  
of back injury





Notice the bi-directional  
work station crane

Balancers can also be  
used to unload pallets  
and make positioning  
goods at various  
locations within a  
machine or work  
center

these trays of parts become virtually "weightless"



These lightweight lifts are highly maneuverable



Inexpensive stackers to transport pallet loads in and around work stations - even load/unload directly from them



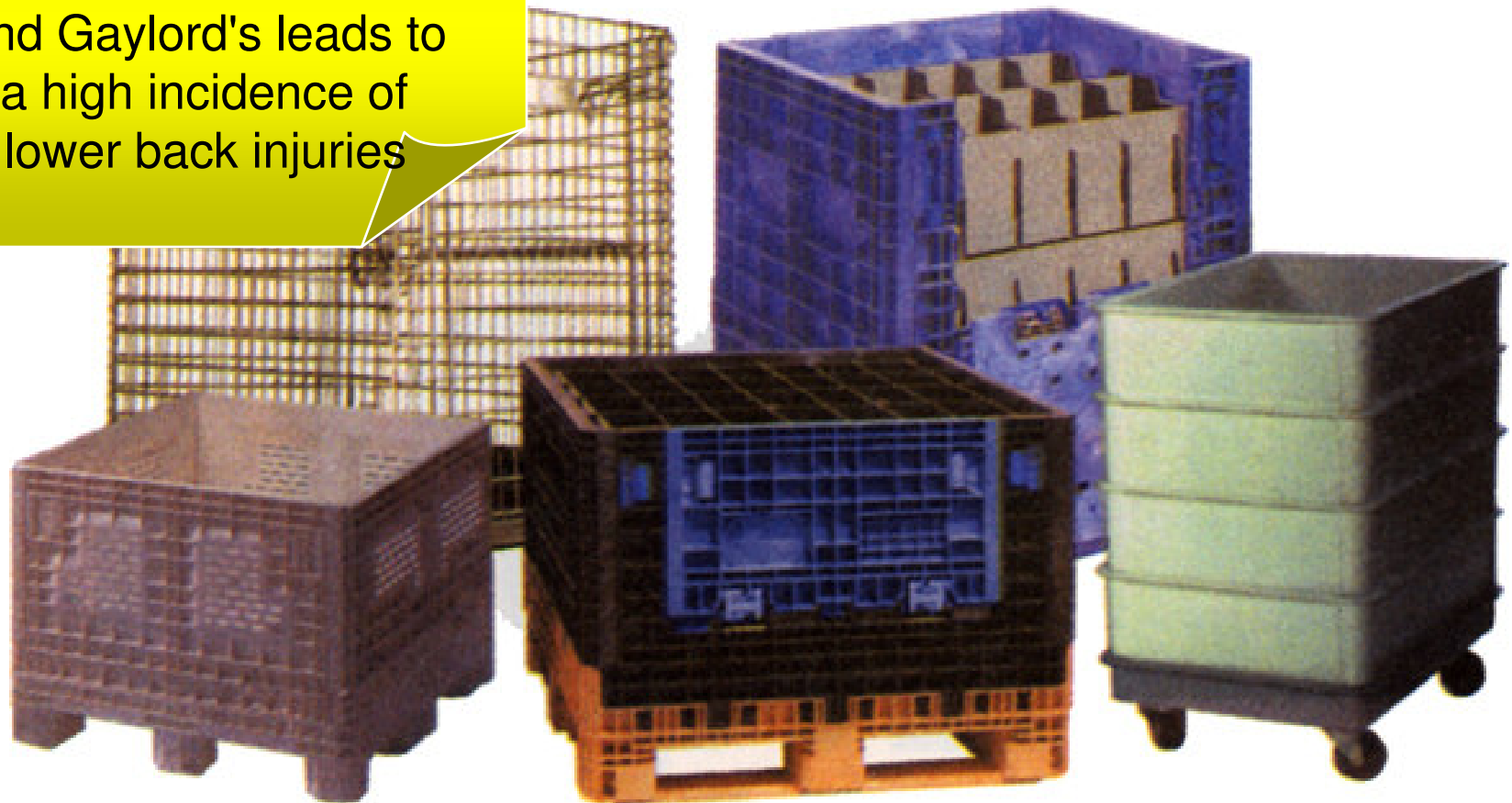
This is a really  
cheesy job!

This vacuum  
lifter makes  
easy lifting and  
maneuvering of  
these heavy  
cheese wheels



# Containers

Manual loading and unloading of wire baskets, containers and Gaylord's leads to a high incidence of lower back injuries







Issues: Back bending,  
back extension, over  
reaching, fatigue and  
product loss



# Problem



# Solution



# Parts picking made productive from fixed height tilters



Notice the high hinge causing the container to elevate as it tilts



This spring  
loaded  
positioner  
elevates the  
goods in the  
container to  
eliminate the  
bending





This lift and tilt provides access to all of the parts in this container

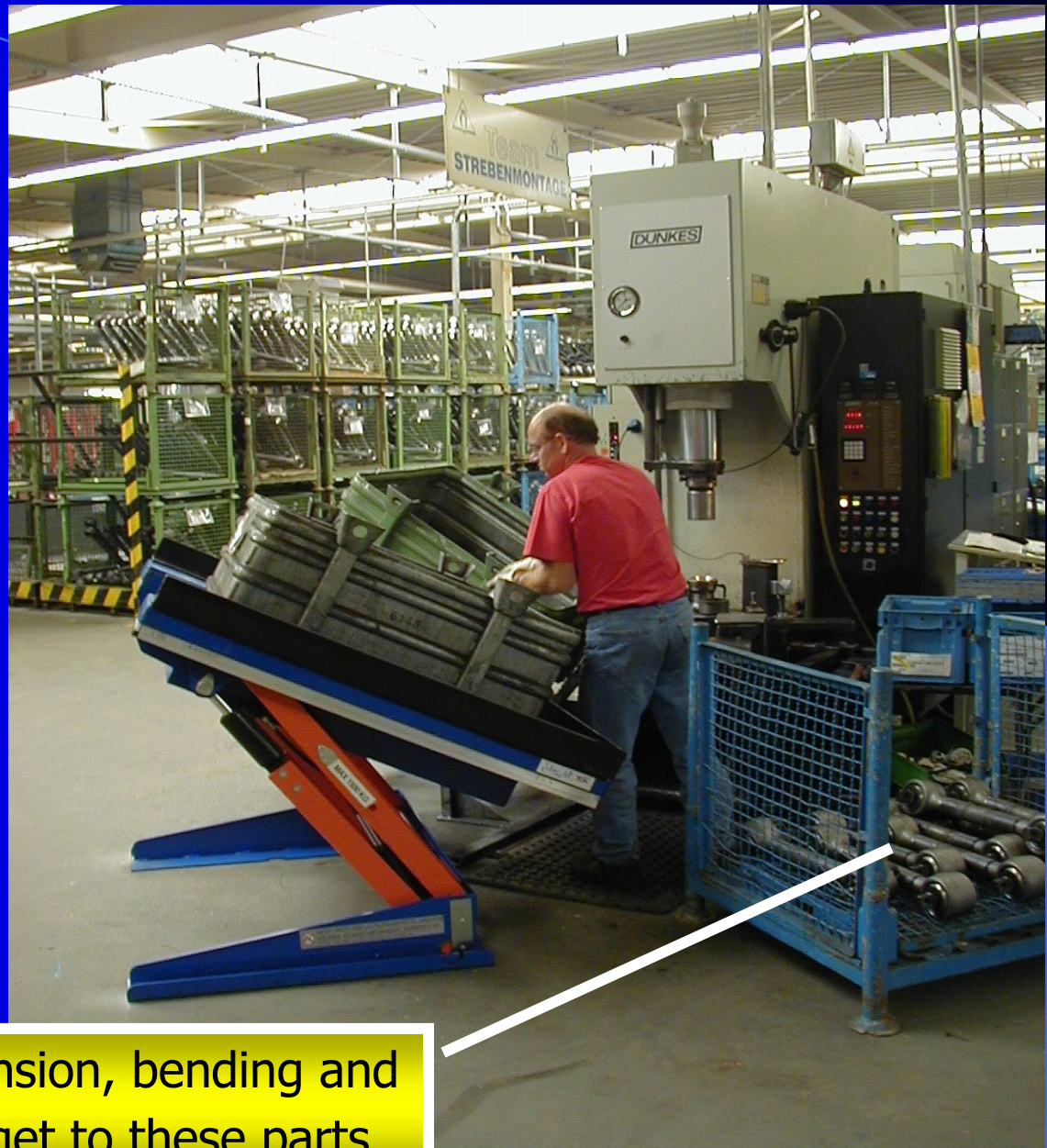


# Parts picking on assembly line





Parts  
picking  
at a  
hydraulic press  
work station



Imagine the back extension, bending and reaching required to get to these parts

# Other Material Handling Equipment Solutions



Electric  
chain hoist  
on  
articulated  
jib crane



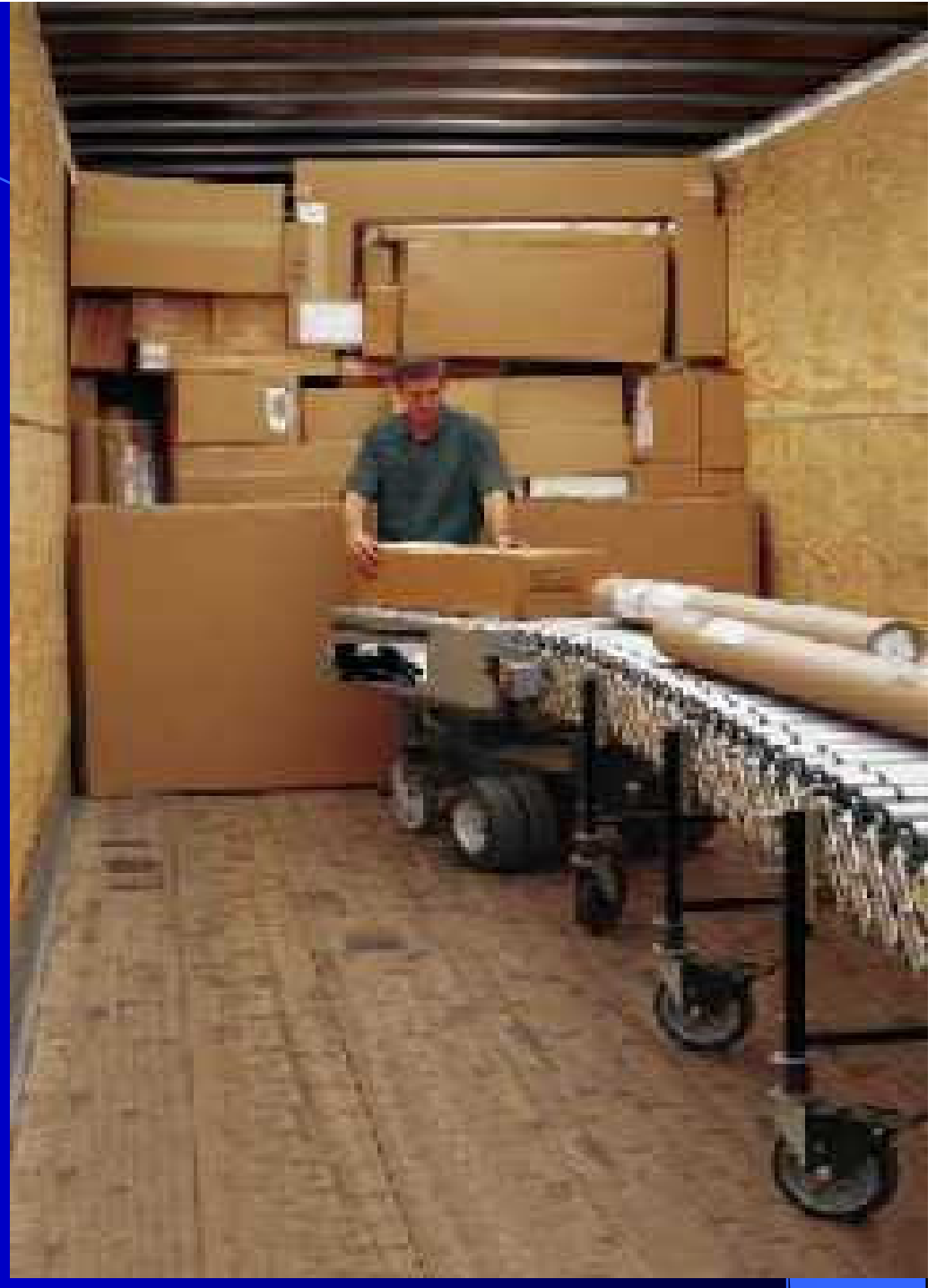
Notice the use of gravity roller  
conveyor to ease the feeding of parts



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



# Portable lift for transporting to and then 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



Here are good examples of how industrial tilters foster good ergonomics and eliminate wasted motion





Damaged product on  
the bottom of a pallet  
can be easily  
removed



These devices  
make quick work  
exchanging pallets





Questions?

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