



Point Kaizen

“Kai” Means Change
“Zen” Means Good

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customer experience. improved.

Agenda

- 
- Point Kaizen Overview
 - Principles of Motion Economy
 - Point Kaizen Snop Floor Exercise

Point Kaizen Opportunities

- 
- Eliminate Waste or Rework
 - Increase Flexibility or Eliminate Downtime or Adjustments
 - Reduce Inventory or Floor Space
 - Increase Flow or Rate
 - Improve Productivity
 - Improve Quality or Eliminate Variation
 - Eliminate Overburdened Points or Unreasonable Conditions

Economy of Motion (Ergonomics)

Eliminate Unnecessary Motion

- Reduce eye movement
- Eliminate adjustment
- Eliminate using a hand as a fixture
- Eliminate clean up
- Make the tools return automatically
- Containers designed with easy access for operator
- Combine 2 tools into 1
- Use mechanisms which allow easy machine loading (drop in) and operation
- Product delivered in the proper orientation
- Eliminate climbing
- Place materials and tools in operation order

Shorten the Distance

- Perform work at the most suitable position
- Make the movement the shortest distance
- Reduce the space required
- Reduce operator travel
- Use gravity to move material
- Eliminate reaching and bending
- Have product delivered to the operator in the correct location
- Design equipment with Hanedashi or auto unloading

Economy of Motion (Ergonomics)

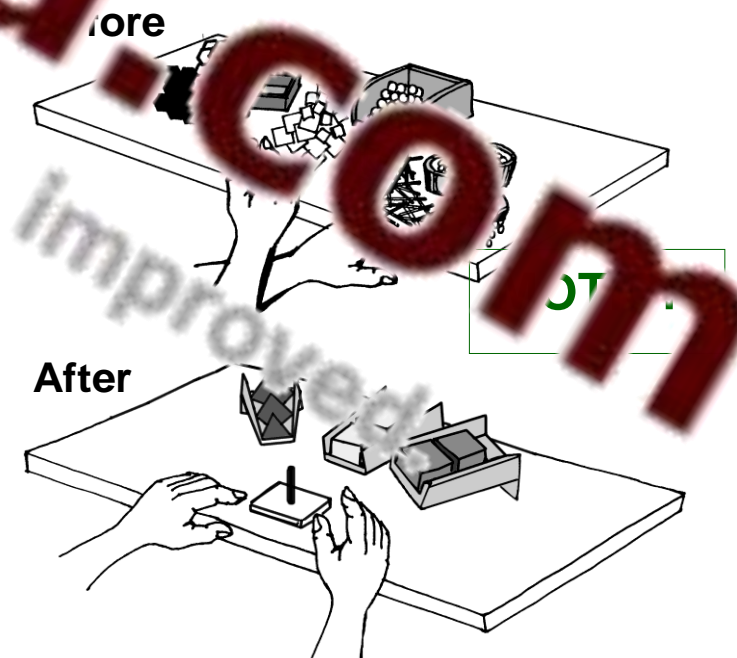
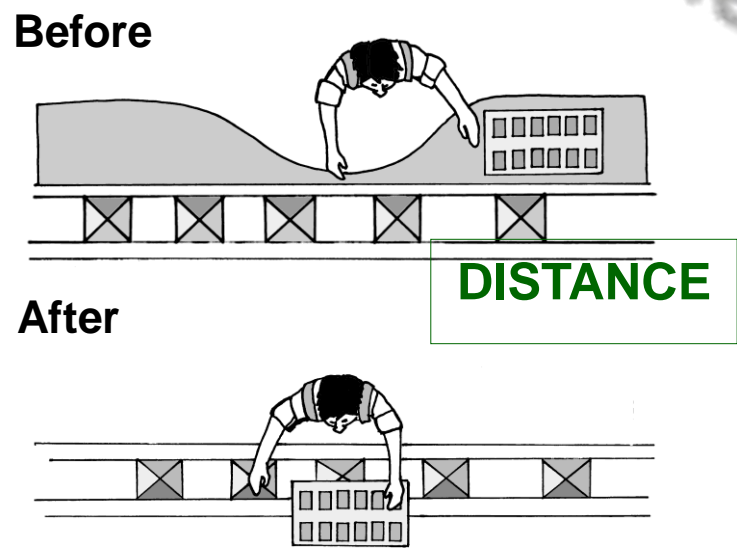
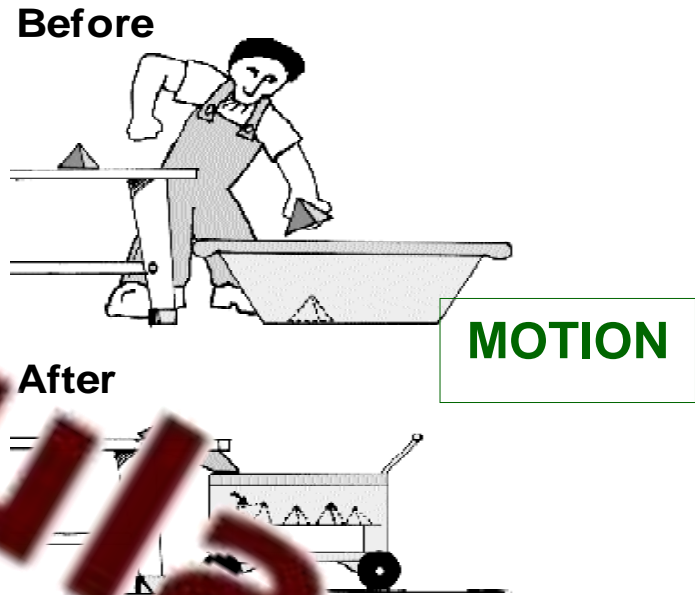
Make motions Easy to perform

- Make motions easy and unrestricted
- Use inertia
- Set the best height of operation (strike zone)
- Make tool grip easy to hold and operate
- Make the clean-up equipment retractable and off the floor
- Make tools light and easy to handle
- No three arm jobs
- Gauges and controls easy to access
- Adequate lighting

Simultaneous Motions

- Hands should start and finish at the same time
- Use a holding device to free up one hand
- Use a cart to carry make-ready and set-up tools and information
- Sequence work to complete all work with one stop at a location
- Configure machines to complete all work from one location

Economy of Motion (Ergonomics)



Easy to see and make adjustments





Poke-Yoke

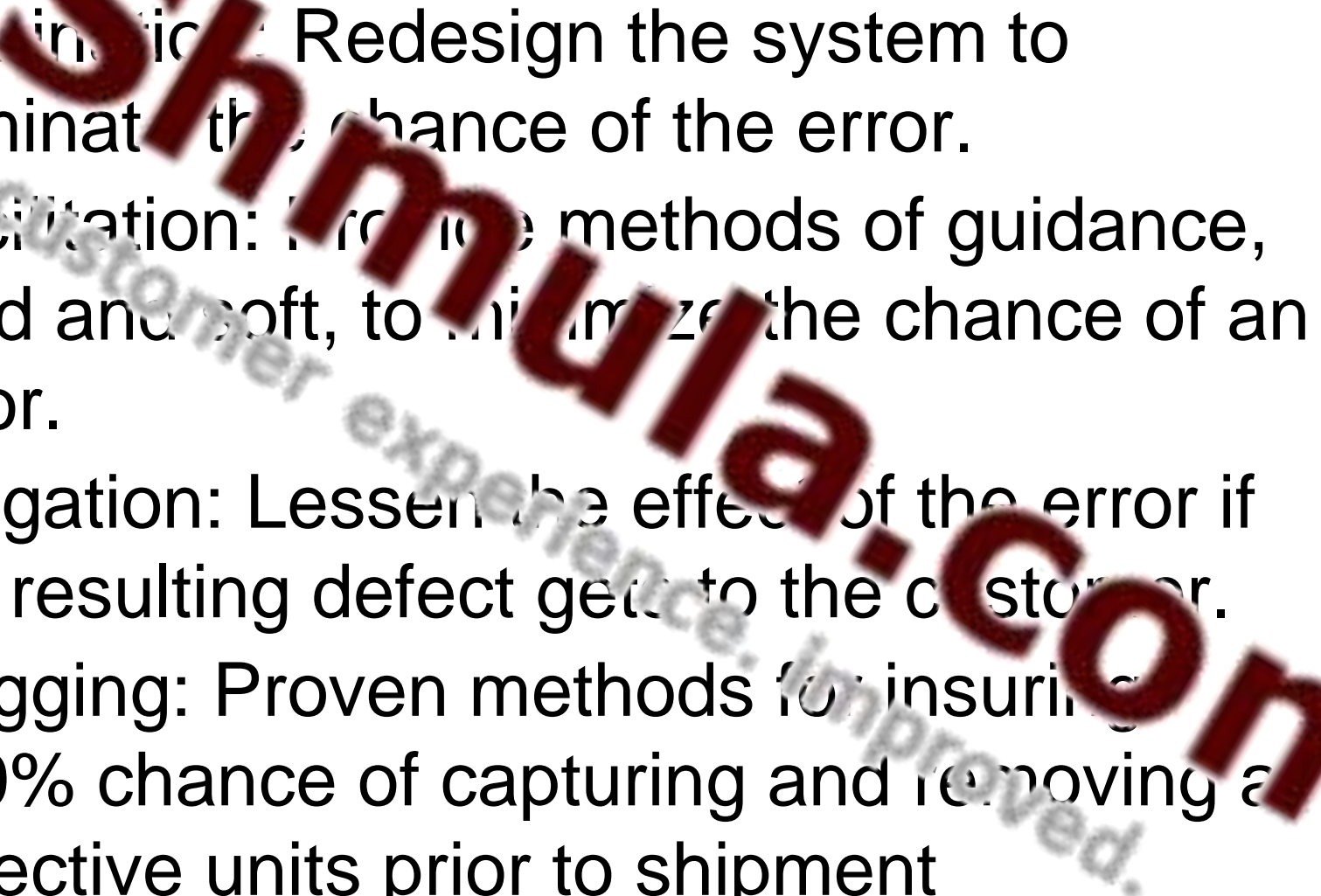
“Yokozuna” – To Avoid

“Poke” – Inadvertent Errors

“It is because the poke-yoke system has the very real capacity to reduce, and eventually to eliminate, defects that I would like to see it adopted in as many companies as possible.

- Shigeo Shingo.

Four Categories of Mistake Proofing

- 
- Elimination: Redesign the system to eliminate the chance of the error.
 - Facilitation: Provide methods of guidance, hard and soft, to minimize the chance of an error.
 - Mitigation: Lessen the effect of the error if the resulting defect gets to the customer.
 - Flagging: Proven methods for insuring a 100% chance of capturing and removing a defective units prior to shipment

Human Errors






- People are not perfect, we make mistakes
- Mistake can cause defects

Two philosophies
about human error

Errors are
inevitable

Errors can be
eliminated

Three Levels of Quality

			
 <p>Definition</p>	<p>Operator check work prior to next operator</p>	<p>Operators check own work before passing to next operator</p>	<p>Automatic check & prevention of defect</p>
<p>Plusses & Issues</p>	<p><u>Plus:</u></p> <p>Generally effective in catching defects</p> <p><u>Issues:</u></p> <p>Corrective action can only occur after defect is made</p>	<p><u>Plus:</u></p> <p>Instant correction possible</p> <p>More palatable than supervisor or peer check</p> <p><u>Issues:</u></p> <p>Operator may compromise quality or forget to perform check</p>	<p><u>Plus:</u></p> <ul style="list-style-type: none"> ■ 100% inspection usually with no extra time or expense ■ Instant correction ■ Can usually be applied to the processes ■ Innovative for the competitive advantage

Mistake Proofing in Everyday Life



- Auto-shut-off on gas pumps
- Double-sided car keys
- Auto-flush in public facilities
- Motion detector activation
- Can't start your car in gear
- Ground plug only goes in one way
- Think of some examples

Mistake Proofing For Carb Lovers



The Famous french fry scoop effortlessly delivers remarkably low variation among servings of fries at fast food restaurants the world over.

New generation bottle keeps watery liquid part of ketchup from soaking your bun by separating the ketchup from the bottom. The watery liquid is on top and the last thing to come out.

Characteristics of Mistake Proofing



- Three objectives when mistake proofing;
 - Can't receive bad product
 - Can't make bad product
 - Can't ship bad product
- Reason for mistake proofing device is clear
- Never fails
- Low or no cost
- Made with shopfloor wisdom & ingenuity
- Simple, durable and easy to maintain
- Device idea is transferable to other areas
- Reduces non-value added activities

Red Flags

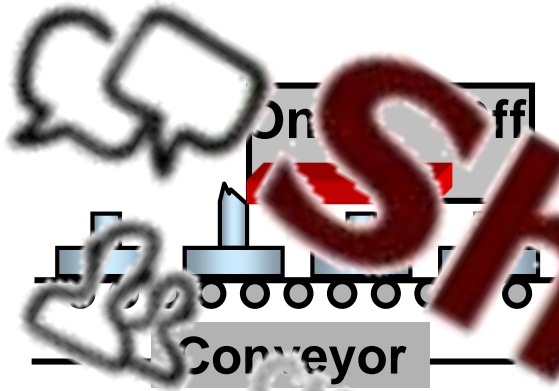
A Red Flag is a condition which can easily cause errors.

Some Red Flag conditions are:

- Adjustments/variables
- Tooling or tool change
- Many/mixed parts
- Multiple steps
- Infrequent production
- Absence of/poor standards
- Symmetry/asymmetry
- Rapid repetition
- No standard work
- High turn over
- Material processing/handling
- Housekeeping
- Foreign matter
- Poor lighting

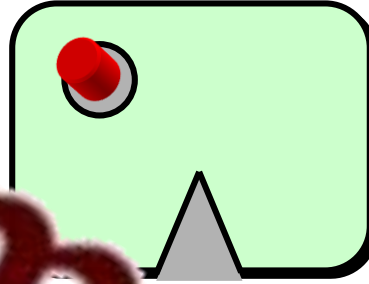


Mistake Proofing Functions



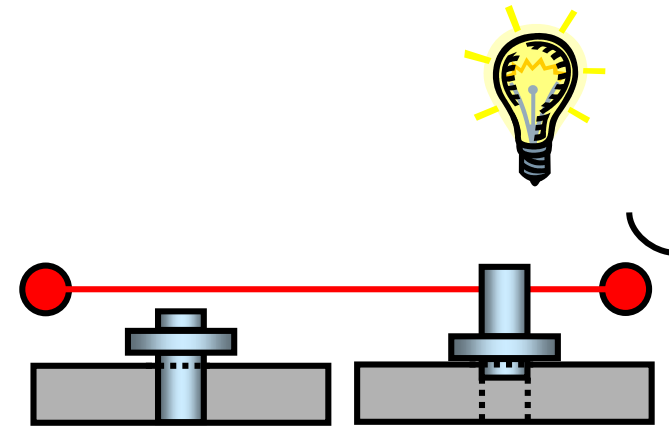
Shut Down

Line stop:
Machine
shuts down
to prevent
defect



Conform

Locator pin:
Part cannot
be inserted
into jig
incorrectly

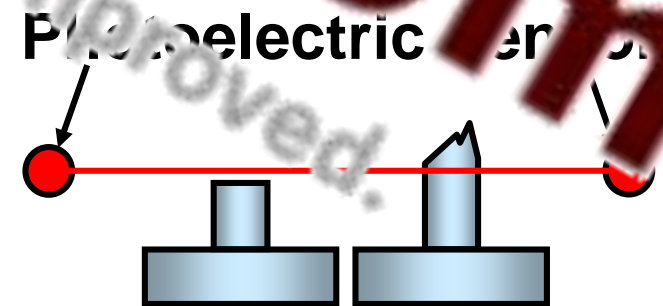
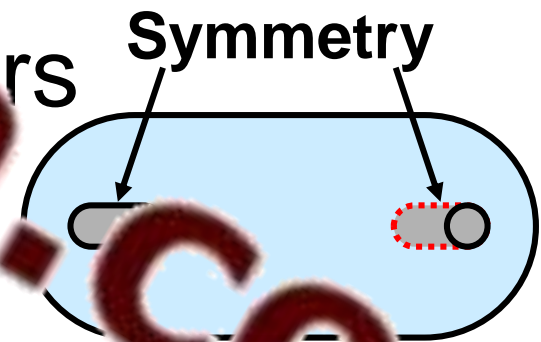
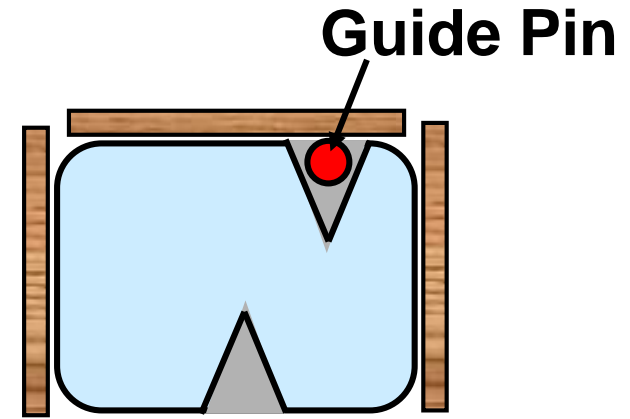


Signal

Light or
hooter
Signal
Operator
instantly
alerted to
problem

Mistake Proofing Device Examples

- Guide rods or pins
- Limited interfaces
- Counters
- Sequence enforcement
- Optical/photoelectric sensors
- Symmetry/asymmetry
- Visual indicators
- Sorting devices
- Go no go



Think of a mistake proof way to measure the length

Tolerance of $\pm .005$



**Measurement device is inadequate
due to measurement units**

Mistake Proofing Summary

- Implement mistake proofing devices whenever possible. Be creative with one piece flow
- No formal training required...use your team and think out of the box...Be creative
- Results in defect free work and relieves the operator of non-value added activity and stress
- Builds a robust process to assure quality
- Innovation is the key to success and to achieve the competitive advantage

Shop Floor Exercises

• Point Keiken

- Review observations from the previous shop floor exercise & select top 3 improvement opportunities
- Identify NVA steps for improvement
 - Document all collection station items with sketches and pictures to expedite change
 - Document time reductions from improvements “before and after”
 - Calculate distance traveled before and after over a year’s time
 - List all safety, ergonomic, and quality improvements made

• Error Proofing

- Identify one issue on the Quality Maps and develop one type mistake proofing measures to prevent the issues from ever happening again
- Identify another issue on the Quality Maps and develop two countermeasures to limit the risk of occurrence and/or the stop the defect from moving downstream.

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