

Mistake-Proofing in the Custom, Short-Run Environment

presented by

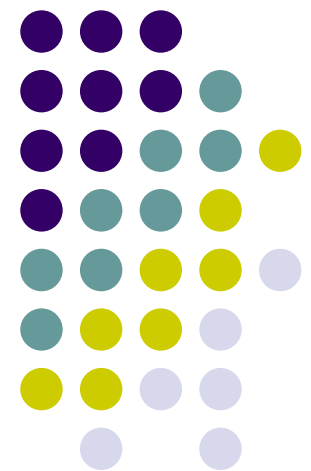
Sam Wagner

Director of Advanced Manufacturing
Donnelly Custom Manufacturing Co.

at **Productivity, Inc.'s**

Lean Management Conference

in Nashville, TN
on October 9, 2008





www.donnmfg.com

How Short Run is Done™

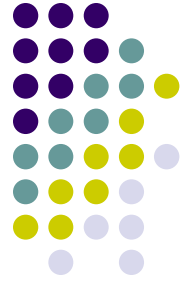


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Mr. Wagner is responsible for the production, quality, training and continuous improvement functions at Donnelly. He holds an MBA and BS in Engineering Management, and is a Certified Trainer in TWI's Job Methods. Mr. Wagner's experience includes executive, management and engineering positions in both high and low volume production of plastic and metal products in a variety of industries including defense and aerospace, construction and automotive.



Agenda

- Defining the custom, short-run environment
- Some of the challenges of this environment
- Mistake-proofing: One way to help solve the short-run puzzle

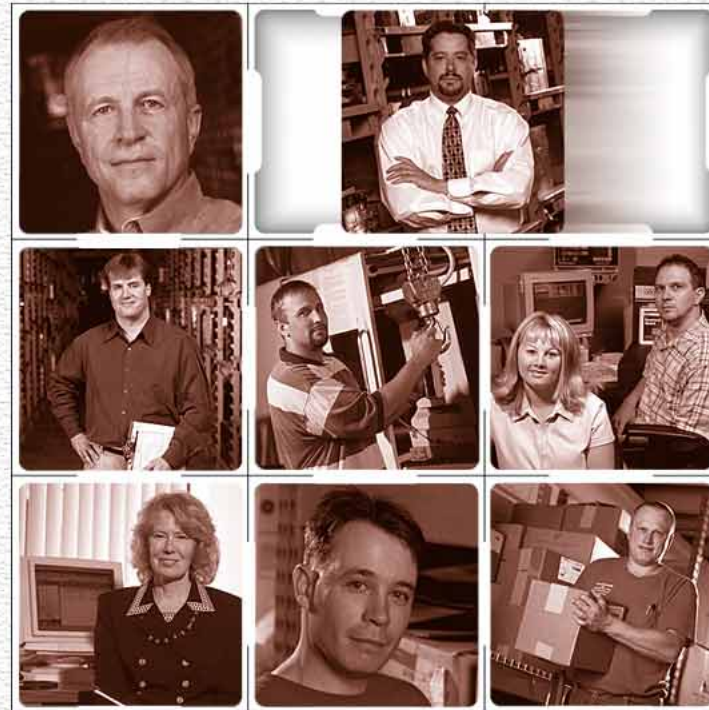
The Donnelly Story

- Donnelly was founded in 1984 as a custom, plastic injection molding company
- A small, one-story building
- Four presses, eight people, no customers
- An idea to focus on short run, close tolerance parts

The Donnelly Story

- Today, the organization is over 220 people strong
 - Best-in-class technologies and quality systems
 - 24/7 Operations, 125,000 square foot facility with 33 presses
 - 700+ Materials used
 - 2500+ active molds 3000+ active parts
 - Industry-leading and world-renowned OEM customers
 - \$28+ Million in Revenues (20% Growth Last 2 yrs)
 - Started Lean journey in late 2002

A LONG HISTORY OF SOLVING THE SHORT RUN PUZZLE



HOW SHORT RUN IS DONE™

- **Mission**

- Deliver Good Products On Time

- **Tag Line**

- How Short Run Is Done

- 40+ changeovers every day
- Median job runs 8 hours

- **Core Values**

- Do your best
- Treat others the way you want to be treated
- Don't be afraid to ask for help
- Always work as a team



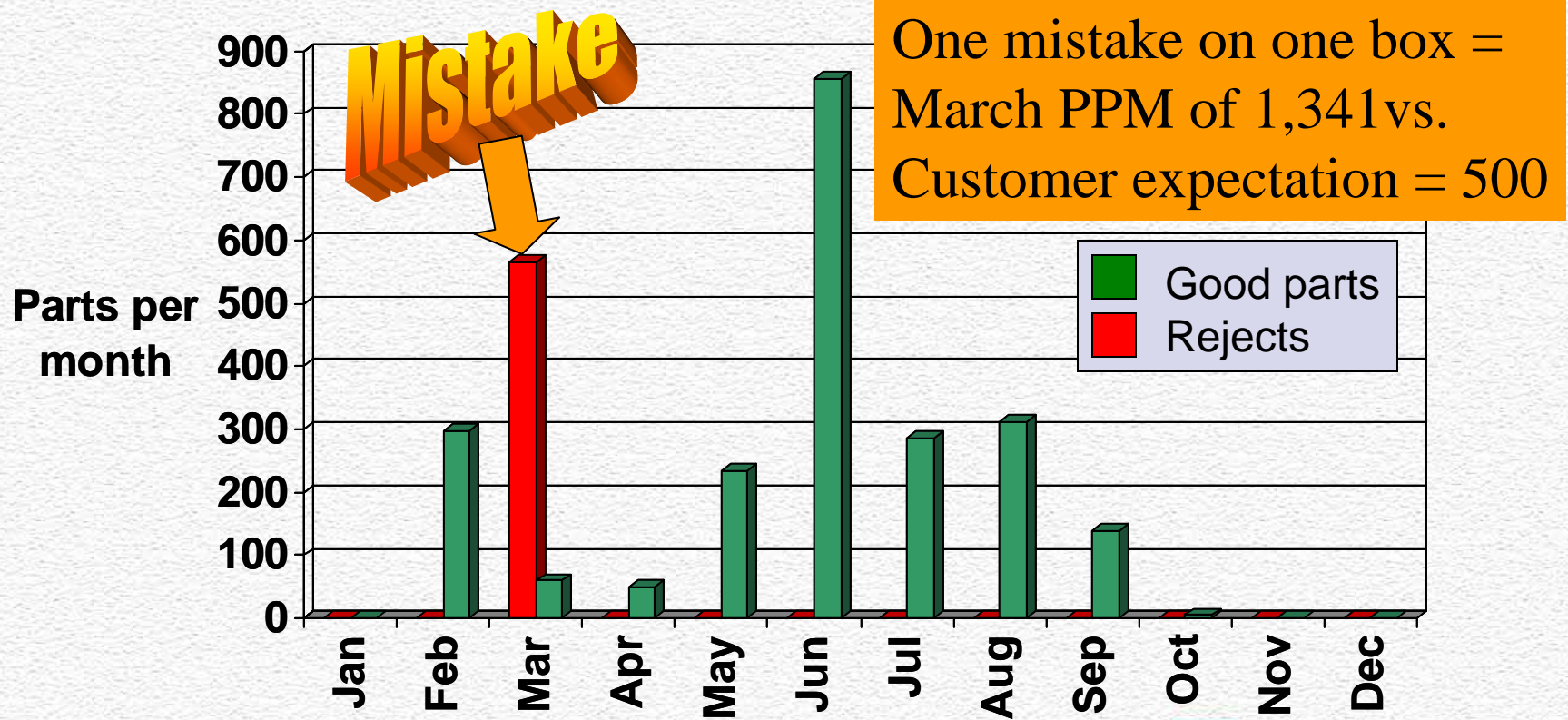
Some Challenges of Custom Short Run

- 1. Addressing the Complexity Factor**
- 2. Lots of changeovers; little mold standardization is feasible**
- 3. How short run is done: through people**

Why Mistake-Proofing?

- **Large OEM customers expect zero defects – yes, really, zero defects – even for low volume products**
- **SPC & Process Capability (C_{pk}) must be done but can't get you there**
- **Short run is done through people and people make mistakes**
- **Most defects are caused by human error**

Quality Performance Without Mistake-proofing (one part #)



Why a Mistake-proofing Workshop

- Concluded the only path to zero defects is through plant-wide mistake-proofing
- Proven TWI structure and philosophy of learn by doing and learn from each other
- Focus on mindset and a structured approach
- Cross-functional
- Immediate application
- Easy to follow up

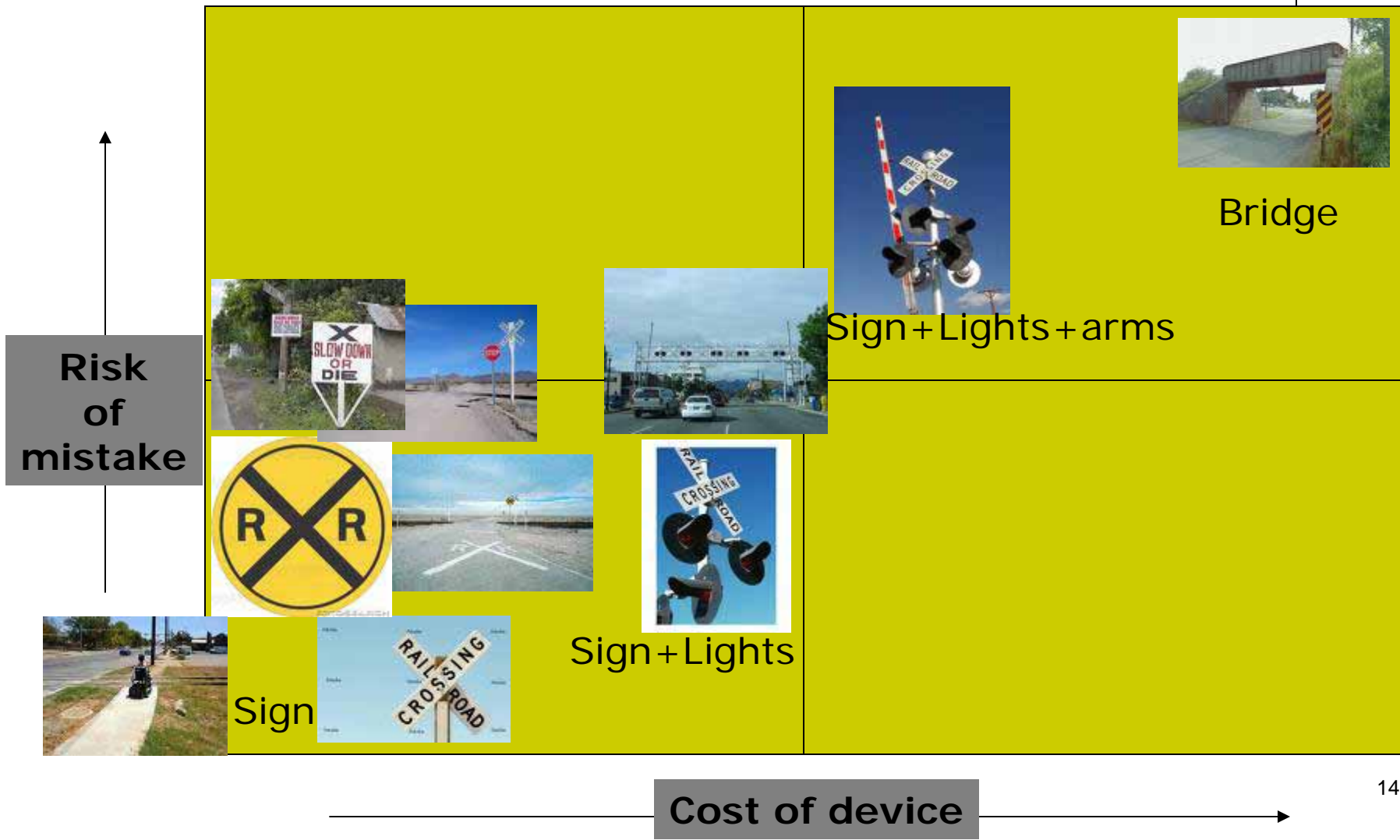
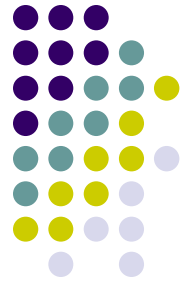
Training Within Industry structure

- Training in 2-hour blocks on 4-5 consecutive days
- Small classes of 8-10 people
- Demonstrate, then learn by doing – learn from each other
- Use today's real problems during the training
- Focus on areas within your control
- Pocket-sized reminder card

Mistake-proofing Workshop

- Success = (TWI + ZQC) x attitude²
- Debunk the top ten myths about mistakes
- Provide lots of examples
- Provide a structured problem-solving approach
- Include many functions in each class
- Show how to use it on today's problems – solve them during class – ½ hour each

RR Crossing Potential Solutions



Some Top Myths about Mistakes

- I don't make mistakes so I don't need this
- Others make mistakes because they aren't paying attention or need to try harder
- Mistakes aren't an issue here
- If you make a mistake, you should quickly and privately take care of it
- We can't mistake-proof everything, so why bother
- Mistake-proofing is too expensive

Structured Approach to Mistake-proofing

- What went wrong – what mistake was made?
- Identify the root cause(s)
 - Has the job been simplified using Job Methods?
 - Was Job Instruction used to train effectively?
- Develop the best solution
 - Consider cost versus risk
 - Is the right way the easy way?
- Apply the solution

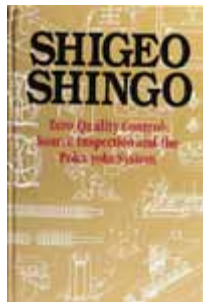
Is the risk reduced?

Results

- Mindset changes occurring
 - “Just try harder” giving way to more permanent fixes
 - Less finger pointing, more celebrating successes
- Substantially reduced rejects due to mistakes
- Improved PPM defect rate by 44%
- With one major OEM customer, went from being “on probation” to being a top supplier
- Also achieved significant benefits in reducing recurring equipment damage

Resources

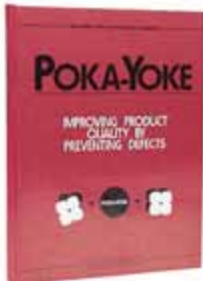
Zero Quality Control: Source Inspection and the Poka-Yoke System, by Shigeo Shingo



List Price: \$80.00
Cat. #: PP9907
ISBN: 9780915299072
ISBN 10: 0915299070
Publication Date: 4/1/1986
Number of Pages: 336



Poka-Yoke: Improving Product Quality by Preventing Defects



List Price: \$75.00
Cat. #: PP9931
ISBN: 9780915299317
ISBN 10: 0915299313
Publication Date: 2/1/1989
Number of Pages: 304

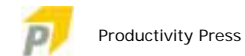


www.mistakeproofing.com

Training Within Industry: The Foundation of Lean, by Don Dinero



List Price: \$45.00
Cat. #: PP7307
ISBN: 9781563273070
ISBN 10: 1563273071
Publication Date: 5/27/2005
Number of Pages: 352



The TWI Workbook: Essential Skills for Supervisors, by Patrick Graupp & Robert J. Wrona



List Price: \$45.00
Cat. #: PP7315
ISBN: 9781563273155
ISBN 10: 1563273152
Publication Date: 2/13/2006
Number of Pages: 224



Make No Mistake!: An Outcome-Based Approach to Mistake-Proofing, by C. Martin Hinckley



List Price: \$80.00
Cat. #: P7227
ISBN: 9781563272271
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Number of Pages: 440

