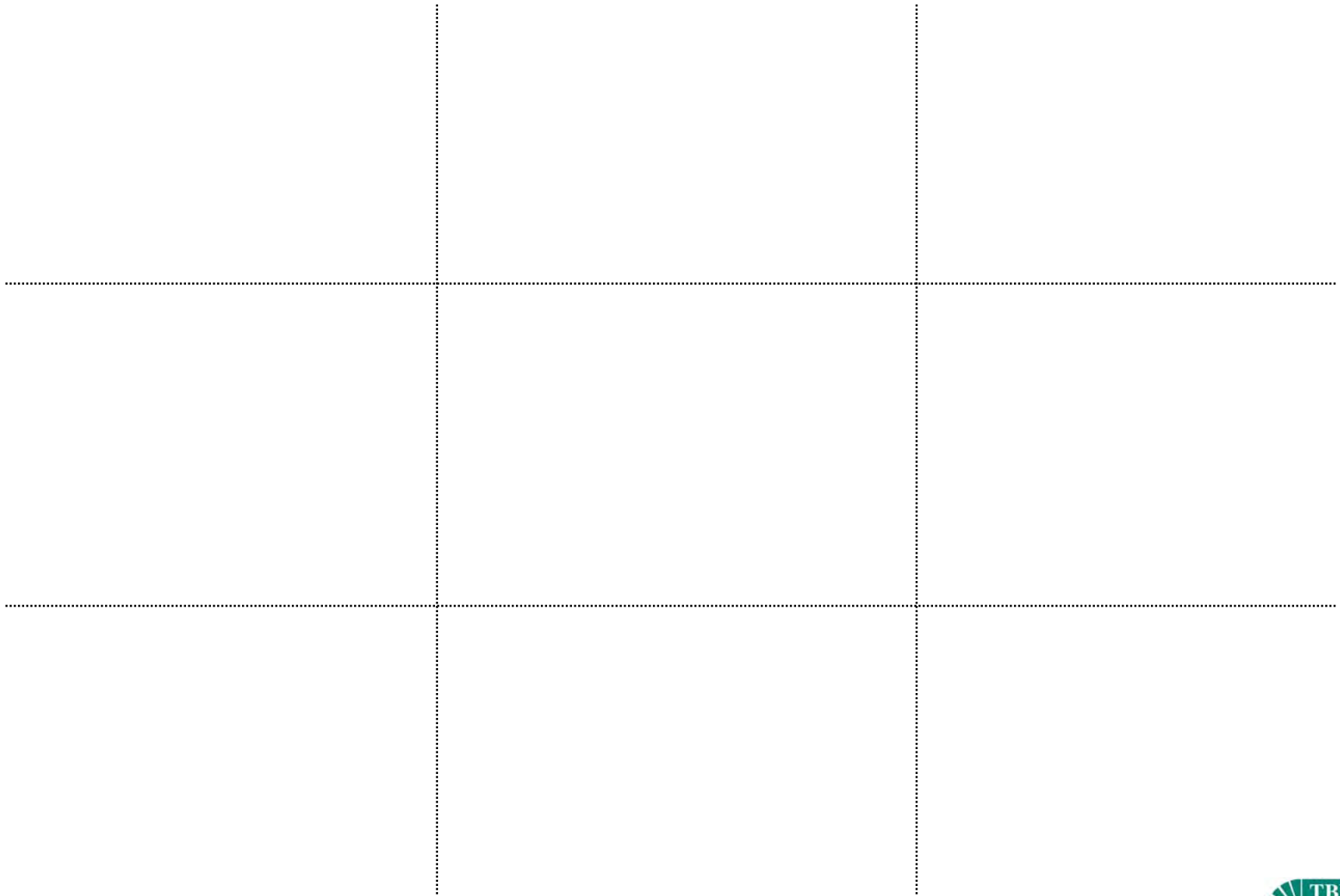




# Using Standard Operations

Presented at MedTech 2010  
Joe Panebianco  
October 5, 2010

**Take a piece of paper & draw a Pig.  
Then hold up your drawing.**



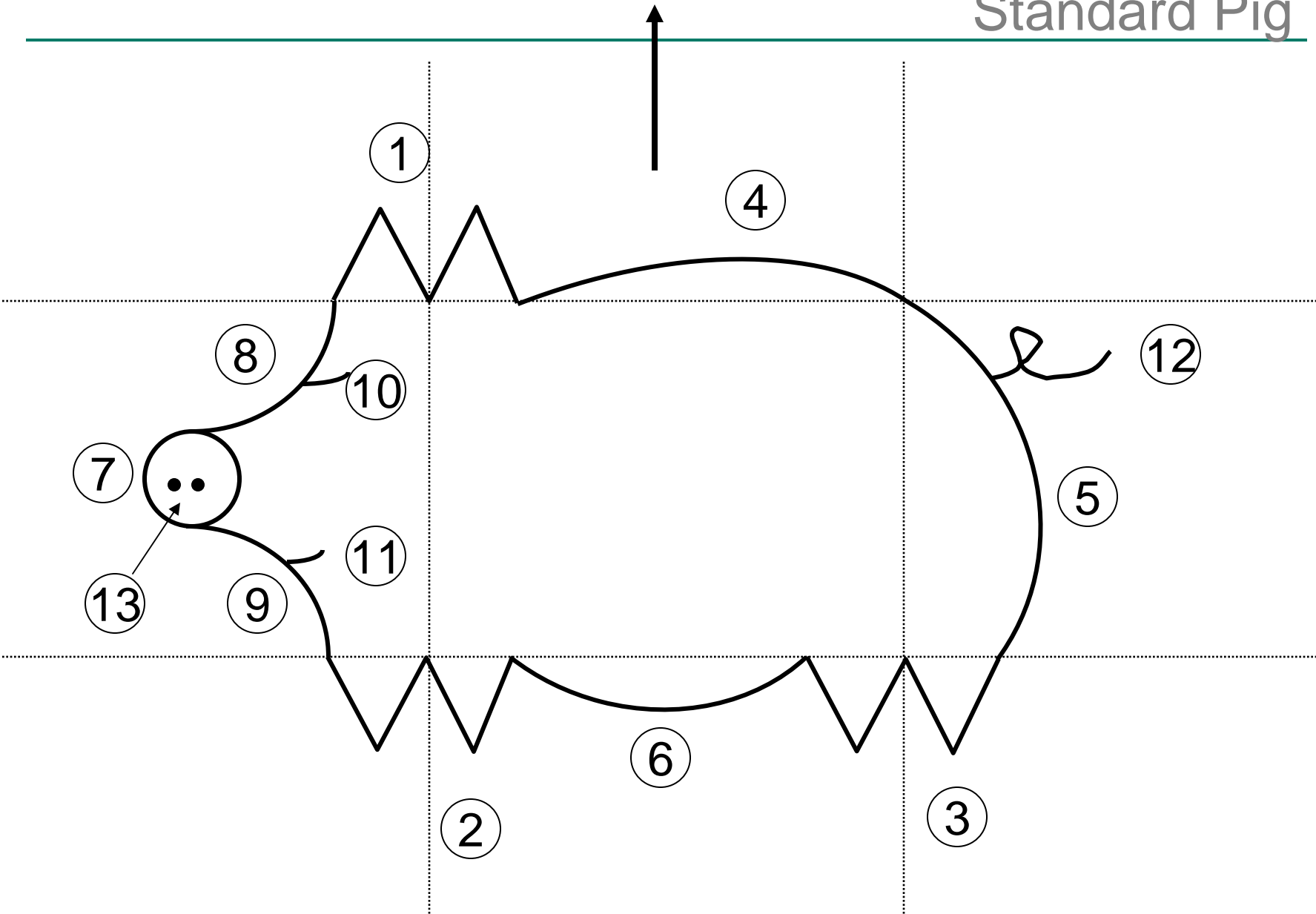
# Standard Work: Standard Pig Instructions

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1. Draw a letter M at the top left intersection. Bottom center of M touches the intersection.
2. Draw the letter W at the bottom left intersection. Top center of W touches the intersection.
3. Draw the letter W at the bottom right intersection. Top center of W touches the intersection.
4. Draw an arc from the letter M to the top right intersection.
5. Draw another arc from the top right intersection to the bottom right W.
6. Draw an arc between the two bottom W's.
7. Draw the letter O in the center left box.
8. Draw an arc from the letter M to the tangent of the circle.
9. Draw an arc from the left W to the tangent of the circle.
10. Draw an arc for the eye. Half way between M and circle.
11. Draw an arc for the mouth. Half way between W and circle. Must be a happy pig!!
12. Draw the cursive letter e near the top of arc on the right.
13. And finally draw two dots in the middle of the circle for the pigs nose.



# Standard Pig



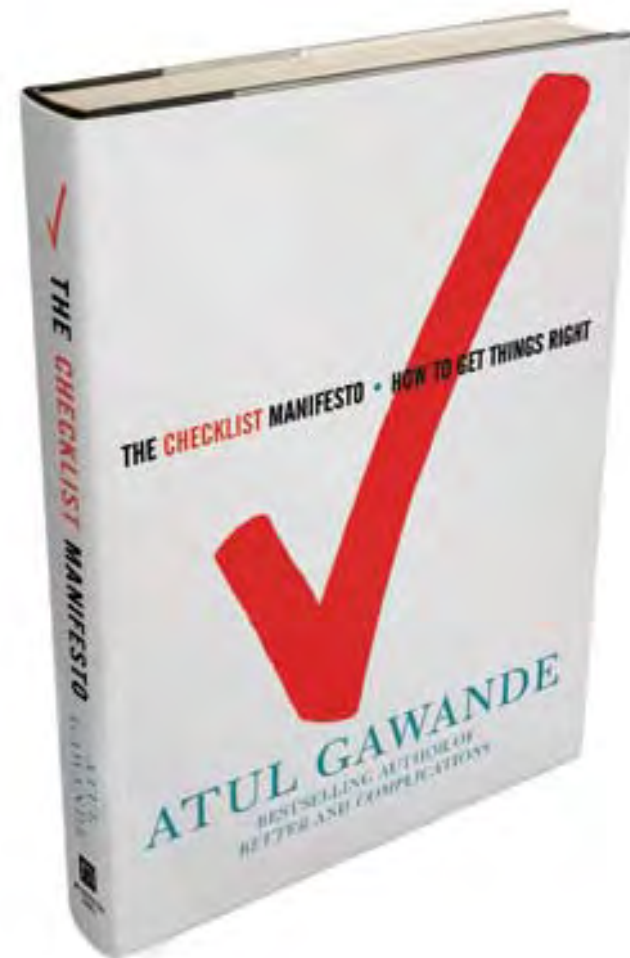
How can your company benefit from Standard Work?



## Do You Use Checklists?

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No matter how much of an expert you are, a well-designed checklist can dramatically improve outcomes



# Checklists = Best Practices/Standard Work

*“It may be ok for the grocery list or chores, but not for my job. I know how to do my job!”*



- > Pilots have been using strict checklists for 60+ years. Would you feel comfortable if they stopped?
- > When a group of doctors was asked if they would use a checklist, 20% said no.
- > When that 20% was asked if they wanted doctors to use a checklist if they were being operated on, 94% said yes!

# Checklist Example

Actual checklist developed for doctors in one hospital for catheter insertion

1. Wash hands with soap
2. Clean patient's skin with antiseptic
3. Put sterile drapes over entire patient
4. Wear mask, hat, sterile gown and gloves
5. Apply sterile dressing over insertion site once line is in



Doesn't this seem obvious?

# Checklist Example



## Catheter insertion results over one year

- > 10-day line infection rate went from 11% to ZERO

## Results over two years

- > 8 deaths prevented
- > \$2MM saved
- > \* Nurses empowered to remind doctors to perform every step

Back to basics... with discipline and focus



# Standard Operations

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**Standard  
Operations**

Standard Work &  
One Point Lessons

Auditing  
Standard Work

Training & Tracking  
Operators

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# Standard Work & Single-point Lessons



# Why have Standard Work?

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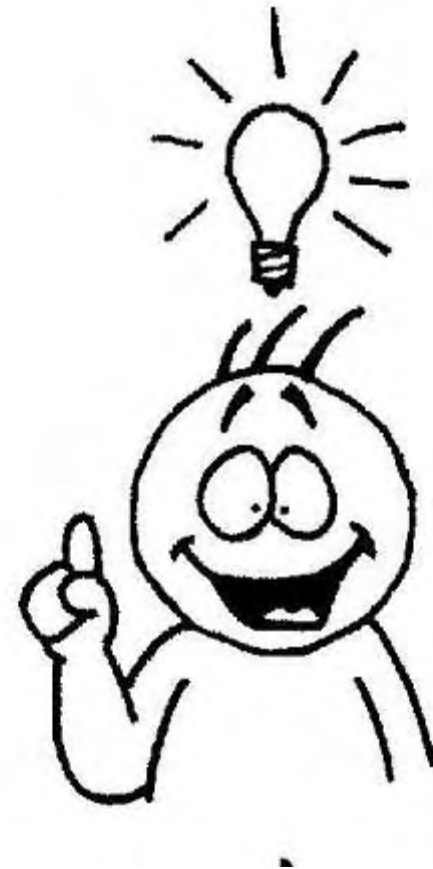
- > Train operators
- > Sustain result
- > Reduce variation
- > Leverage best practices
- > Provide baseline for future improvement

Foundation for continuous improvement & sustainment

# Characteristics of Standard Work

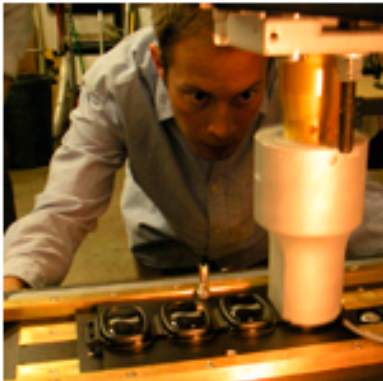
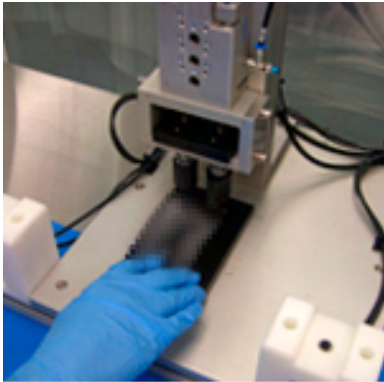
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- > Visual
- > Clear and concise
- > Easily understood
- > Available to operators



# Types of Standard Work

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- > Machine startup & shutdown
- > Machine operation
- > Trouble shooting & abnormalities
- > Performing operational checks
- > Product change

---

# Standard Work Examples



# Standard Work

Catalog / Part Number(s): 7506(-04,-05,-06)		Call / Line Name: V Care		Sequence Number: 4		Manufacturing Procedure: MP-09-98			
		Sequence Description: UV Primer		Revision: AK					
<b>Standard Operation Sheet</b>									
 <p>Cervical Cone ID Fixture</p>		 <p>CERVICAL CO P/N: 7506-01 use 9745 P/N: 7506-02 use 9746 P/N: 7506-04 use 13034 P/N: 7506-05 use 13033 P/N: 7506-06 use 13035 P/N: 7506 use 7173</p>		 <p>LOCK COLLAR 7179</p>		 <p>ASSEMBLED SCREW/COLLAR</p>		 <p>SET SCREW 7450</p>	
		 <p>Band Location</p>				 <p>VAGINAL CONE 7174</p>			
Safety +	Other	Step #	Description of Work Content	Cycle Time:			Tools & Equipment w/ Settings		
				Operator	Machine	Total			
		3.1	Using the adhesive dispenser apply small amount of adhesive directly to the foam applicator tip. (Note: Do not use UV adhesive material that has been subjected to the air in the Q-Tip Holder. Use new applicator if necessary)	12	-	12	EFD Adhesive/Primer Dispenser # 2416 or equiv. model		
		3.2	Apply two bands of adhesive to the balloon end of the V-care tube (per pic 1). One band at the tip and one band at the shrink sleeve. Bands must be complete around tube. Repeat step 2.1 as needed	17	-	29	Cure Machine #1383 or Equiv. Model		
		3.3	Place dimple end of tube onto the UV machine's mandrel (per pic 2).	10	-	39	Loc-Tite #7443		
		3.4	Activate the UV Station foot pedal.	5	60	44			
		3.5	Move the rod, position on the machine to the 2 <sup>nd</sup> cure location, and reactivate the UV station Foot Pedal	12	60	56			
		3.6	Pick up Standard WIP part. Pick up cone to be used, and check ID with Pin gauge. Place cones and locking assembly on the V-Care tube (per pic 3). Note- Turn the screw through the lock collar until it starts protruding into the center of the lock collar.				EXFO Light Source: Series 2000 or Equiv. Model Cervical Cone ID Gauge # 3794		
Cycle Time is for Reference Only				Total Cycle Time		<b>56</b>	<small>2.4 Machine times are internal to other cycle time elements.</small>		

# Machine Operation



## Standard Operation Sheet

<b>Cell / Line Name:</b> 7/8" hex Gyrolok w/1/2" MNPT		<b>Part Name / Number:</b> P8CM8316		<b>Work sequence</b> <u>1</u> of <u>1</u> From (operation): Bar machine To (operation): Finishing		<b>Process sheets:</b>		<b>Date Created:</b> 2/09/05 <b>Date Revised:</b> 2/16/05																								
<b>Takt time:</b> 44 seconds <b># of units required:</b>		<b>Standard Work Layout</b> 				<b>Part Drawing</b> 		<b>Quality check</b> ◊ <b>Safety</b> + <b>Std WIP</b>  <b>Std WIP Qty</b> 5																								
<b>Tools required:</b> Counter sink drill Marker Grinding wheel Thread roller		<b>Safety equipment:</b> Safety glasses Safety shoes Machine guards in place		<b>Work Content Graph</b> [ 1 sec/div ] 						<b>Critical Points &amp; Quality Check Points</b>																						
<b>Step #</b>	<b>Description of work content</b>	<b>Man time</b>	<b>Auto time</b>	<b>Walk time</b>							<b>1 DEFECTIVE PARTS</b>  .417 - .427 Diameter .5055 - .507 Diameter		<b>2 DEFECTIVE PARTS</b>  796 - 797 NPT Diameter		<b>3 DEFECTIVE PARTS</b>  1.51 +/- .01 Overall Length .7406 - .7487 Major Thread Diameter		<b>4 DEFECTIVE PARTS</b>  .7500 - 20 UNEF Thread Ring		<b>5 DEFECTIVE PARTS</b>  .7500 - 20 UNEF NO-Go Thread I .084 - .089 @ .2 Basic Diam													
<b>Totals</b>		26	+	8	=	34	=	44	-	34	=	10	<b>1 IN</b>		<b>1 OUT</b>		<b>2 IN</b>		<b>2 OUT</b>		<b>3 IN</b>		<b>3 OUT</b>		<b>4 IN</b>		<b>4 OUT</b>		<b>5 IN</b>		<b>5 OUT</b>	

Manual operation ——— Operator walk time   
 Automatic operation ..... Operator wait time



# Machine Changeover

1. **Apply Three Minute Rule**
2. Move Ejector Bar Back
3. Remove 1<sup>st</sup> & 2<sup>nd</sup> Mandrel and Give to Packer
4. Packer Places Mandrels on Trolley
5. Mechanic Closes Gate & Presses Reset Button
6. Mechanic Places Machine in Manual Mode
7. Mechanic Jogs Machine Around Until Next Mandrel is in Position
8. Repeat steps 3 thru 7 Until all Mandrels are Removed
9. Rebuild All Mandrels
10. Install 2 Mandrels (Caution: Ensure Slot is in Correct Position)
11. Mechanic Closes Gate & Presses Reset Button
12. Mechanic Jogs Machine Around Until Next Mandrel is in Position
13. Repeat steps 10 thru 12 Until all Mandrels are Installed
14. Position Pneumatic Clamp Cylinder in Centre of Can
15. Set Ejector Bar in Full Forward Position to ensure ejector ring extends 1.5 mm beyond mandrel front face. **(Requires Two People)**
16. Set Ejector Bar Sensor to Read Bar at Full Retracted Position
17. Set Out-Feed Chute Using Proper Can Length
18. Set In-Feed Chute to Markings on Machine
19. Empty Hopper to Change Caps *(if required)*

10



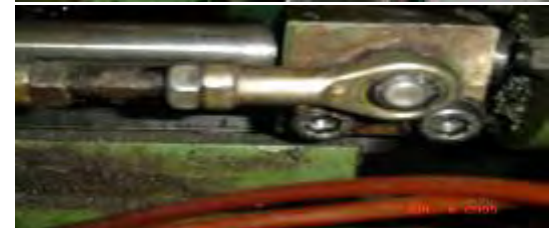
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15



15



16

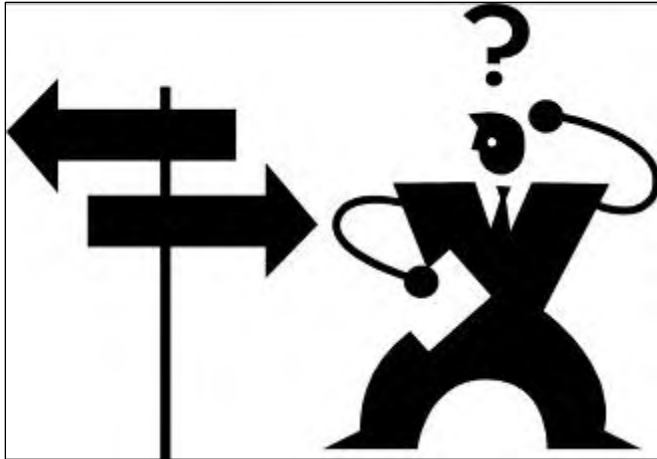


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# Examples of Single-Point Lessons



# When to use Single-Point Lessons



- > Used to explain task that is not well understood
- > Process step has changed
- > Critical step that must be done right – such as safety
- > Used to train operators

Drives Correct Behavior

# Horseshoes Puzzle Single-Point Lesson

Standard Work

Rev. 0.00

11/4/03

1. With both forearms parallel to the floor, hold the horse shoes with both hands in front of your chest with the chain links fully extended. Grip the shoes in the middle of the curve with the right palm facing your chest and the left palm turned away from your chest.
2. Move the horseshoe in your right hand slightly closer to your chest (approximately one inch).
3. Twist your left hand around so that the palm is facing your chest.
4. Bring your elbows down so that your knuckles are turned up towards the ceiling. Maintain the horseshoe (and the attached chain lengths) in your right hand closer to your chest.
5. Manipulate the ring so that both of the inside chain lengths pass through the ring. (The ring passes over both chain lengths that are closer to your little fingers.)
6. Transfer the horseshoe in your right hand to your left hand, while allowing the ring to slide down the length of the horseshoe. Align the horseshoe from your right hand with the horseshoe in your left hand.
7. Using your right hand slip the ring up and off the right side of both horseshoes.

**Consistently, quickly done right each time!**

**1, 2, 3, ...**



# Knife Change Over Single-Point Lesson

One Point Lesson

Rev. 0

8/6/05

- 1. Lock Out Machine (Safety)**
2. Start From Right Side
3. Place Block Against Far Right Hand Knife Holder, Push Second Knife Holder Against Left Hand Side of Block and Tighten Screw.
4. Repeat Step 3 for Appropriate Number of Knives.



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# Training & Tracking Operators



## Prepare the Trainee

- > State the name of the job / task
- > Find out what the worker already knows about the job
- > Get the worker interested in learning the job
- > Place the worker in the correct position – safety first

## Present the Operation

- > Demonstrate one work element at a time
- > Explain the reasons
- > Present no more than the trainee can master

## Try out Performance

- > Trainee tests the job / corrects for errors
- > Trainee explains work elements while doing the job

## Follow-Up

- > Trainee does the job on his own
- > Knows where to go for help
- > Check for progress frequently
- > Provide coaching, taper-off, then follow-up

# Skills Matrix Example

	LH Main Frame	RH Main Frame	Tongue P/Up Assy	Pickup Assy	Tailgate Assy	LH Chain & Sprockets	RH Chain & Sprockets	Belts	Hydraulic Hoses RH	Hydraulic Hoses LH	Checkman
Jim Pink	■										
Keith West		■									
Tim Ball			■								
Bill Vanden				■							
Steve Johannsen					■						
Bruce Hart	■	■			■	■					
Wayne Beek							■				
Denny Gray	■					■		■		■	
Tim Worth									■		
Dave Rose											■
Dave Ring											
Rick Robinson	■		■								
Jim Long		■									
Jim Camp			■								
Mary Moss				■							
Joe Heisman					■						

In Training    
  Can Run At T/T    
  Can Set Up    
  Can Train Others

Sample Cross-training Matrix Model in Excel



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# Auditing Standard Work



## Why Audit Standard Work

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- > Verify all operators are following the same process
- > Ensure safety, quality and productive of the process
- > Identify opportunities for improvement

- > Does the operator perform the steps correctly in the time permitted
- > Ask the operator what the step does and why it is important to the process
- > Performs the operation using all PPE and safety procedures



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# Leader Standard Work



## A Great Working Definition

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*“The culture of a company is the behavior of its leaders. Leaders get the behavior they exhibit and tolerate. You change the culture of a company by changing the behavior of its leaders. You measure the change in culture by measuring the change in personal behavior of its leaders and the performance of the business.”*

Larry Bossidy (former CEO of Honeywell)

Author of the book “Execution”



## Management Systems Drive Behavior

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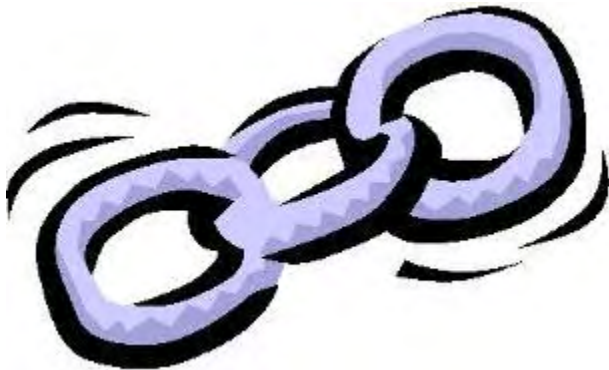
- > **Management *Systems* are a better predictor of behavior than the *Personality* of the person**
  - > When a person 'fails' it means that we have either selected the wrong person or our management system has failed to drive the right behaviors. In either case, the solution rests with management.
  - > Some estimates are that the physical changes to the process represent only 20% of the change needed. The more difficult part, the 80% is changing the system.

Typically, at least 20% of leaders in a typical organization are unable or unwilling to make the lean conversion

# The Missing Link in the Chain of Progress

---

- > **Lack of sustainment is the single largest issue that organizations face**
  - > The missing link is changing leader behavior, supported with visual controls and accountability to monitor and enforce desired behavior
  - > Leader behavior is driven by the systems and the culture - What is rewarded/punished?



## Who Should Have Standard Work?

---

In a Lean organization, **EVERYONE!**

Role	Percentage of Time Allocated to Standard Work
Executives	10-15%
Value Stream Manager	25%
Support Department Managers	50%
Supervisors	50%
Team Leaders	80%
Operators (Associates)	95% +

*From: David Mann*



# Leader's Standard Work Document: Another Format

- Leader std work: working documents!

**Once daily**

**Multiple times daily**

**“Flow interrupters” and other notes**

**Daily task assignments-self or others**

The document is a handwritten 'Leader's Standard Work Document' for a Superintendent. It is divided into three main sections: 'TASKS', 'NOTES', and 'TASKS'. The left 'TASKS' section contains a list of tasks with checkboxes, including '7:00 AM - 8:00 AM: Morning Meeting', '8:00 AM - 9:00 AM: Review assignments', '9:00 AM - 10:00 AM: Review assignments', '10:00 AM - 11:00 AM: Review assignments', '11:00 AM - 12:00 PM: Review assignments', '12:00 PM - 1:00 PM: Review assignments', '1:00 PM - 2:00 PM: Review assignments', '2:00 PM - 3:00 PM: Review assignments', '3:00 PM - 4:00 PM: Review assignments', '4:00 PM - 5:00 PM: Review assignments', '5:00 PM - 6:00 PM: Review assignments', '6:00 PM - 7:00 PM: Review assignments', '7:00 PM - 8:00 PM: Review assignments', '8:00 PM - 9:00 PM: Review assignments', '9:00 PM - 10:00 PM: Review assignments', '10:00 PM - 11:00 PM: Review assignments', '11:00 PM - 12:00 AM: Review assignments'. The 'NOTES' section contains handwritten notes: 'Part placement discussion', 'my change discussion', 'Basic Issues', 'Records Updated', 'Support group help'. The right 'TASKS' section contains a list of tasks with checkboxes, including '10:00 AM - 11:00 AM: Review assignments', '11:00 AM - 12:00 PM: Review assignments', '12:00 PM - 1:00 PM: Review assignments', '1:00 PM - 2:00 PM: Review assignments', '2:00 PM - 3:00 PM: Review assignments', '3:00 PM - 4:00 PM: Review assignments', '4:00 PM - 5:00 PM: Review assignments', '5:00 PM - 6:00 PM: Review assignments', '6:00 PM - 7:00 PM: Review assignments', '7:00 PM - 8:00 PM: Review assignments', '8:00 PM - 9:00 PM: Review assignments', '9:00 PM - 10:00 PM: Review assignments', '10:00 PM - 11:00 PM: Review assignments', '11:00 PM - 12:00 AM: Review assignments'. The bottom right section is titled 'Daily Assignments' and contains handwritten notes: 'Developing', 'Assign the work', 'Conduct the work'.

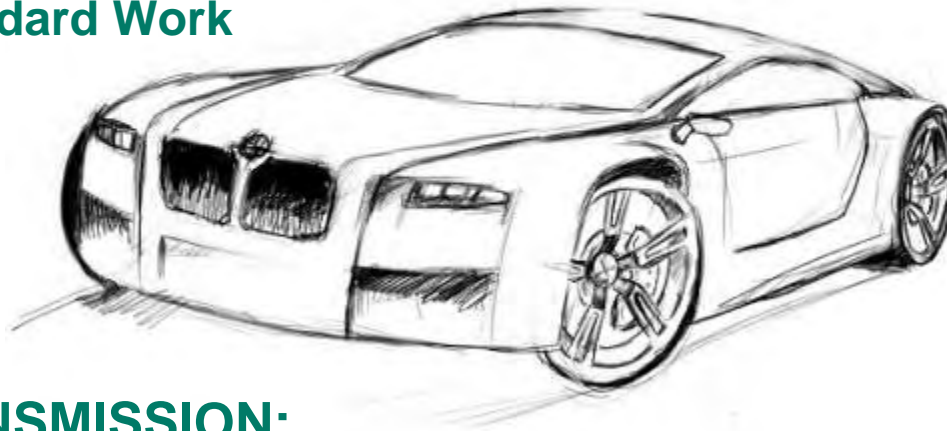


# Making Lean Management Go

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**ENGINE:**  
Leader Standard Work

**GAS PEDAL & STEERING WHEEL:**  
Daily Accountability Process

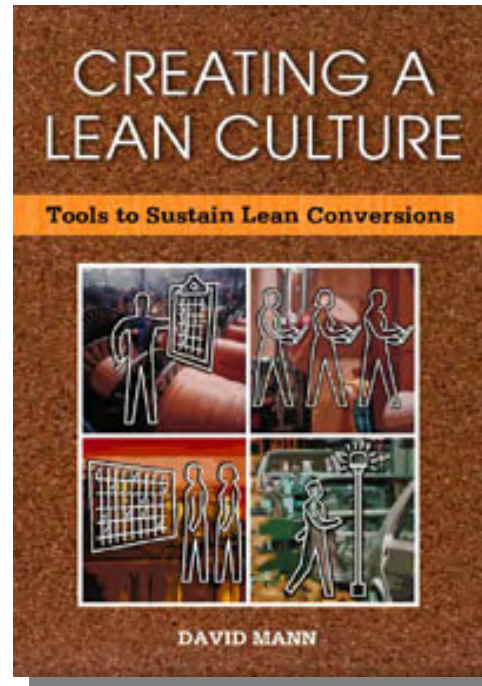
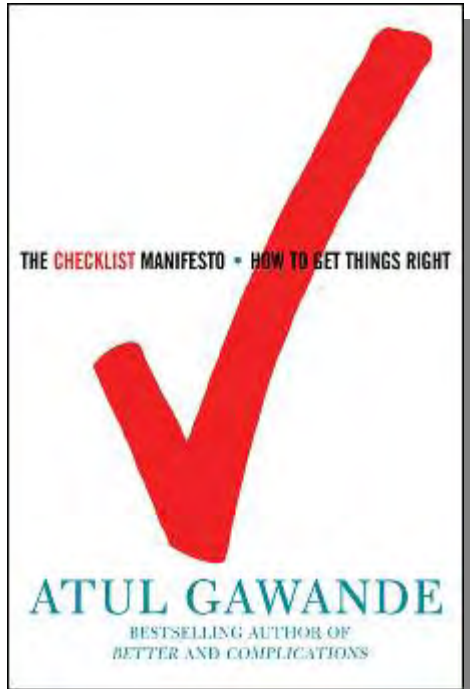


**TRANSMISSION:**  
Visual Controls

**FUEL:**  
Discipline

Inspired by David Mann: "Creating a Lean Culture: Tools to Sustain Lean Conversations"

## Suggested Reading



# Thanks!

- > Any Questions?
- > Joe Panebianco
- > [jpanebianco@tbmcmg.com](mailto:jpanebianco@tbmcmg.com)
- > [www.tbmcmg.com](http://www.tbmcmg.com)