


Women in Industry Forum

Mary Andringa Presentation - 6/14/2010



Lean in the Workplace
 Mary Andringa, President/CEO
 June 2010

VERMEER CORPORATION

Who is Vermeer?

Vermeer Corporation is a leading manufacturer of forage, environmental, underground and specialty excavation equipment. Vermeer is committed to creating products that are built to last - with a global team of employees that are dedicated to taking care of customers worldwide with better solutions.



INNOVATION - THE BEGINNING

The Who, What & Why it all Began

The company was founded upon INNOVATION, defined as a new way of doing something - revolutionary changes in thinking, products or methods. Founder, Gary Vermeer, had a vision for the company that began with creating products that would make his and his neighbors' jobs easier.



INNOVATION - THE TIMELINE

The First Innovations

- Mechanical Wagon Hoist (Early 1940s)
- Model 12 Pow-R Ditcher (Early 1950s)
- Stump Cutter (Late 1950s)
- Round Hay Baler (Early 1970s)



THE VERMEER FAMILY

Placing Our Company in Good Hands

- Bob Vermeer - Chairman of the Board
- Mary Andringa - President & CEO
- Jason Andringa - Managing Director, Vermeer EMEA
- Allison Van Wyngarden - Manager, Continuous Improvement
- Mindi Vanden Bosch - Manager, Marketing Fleet



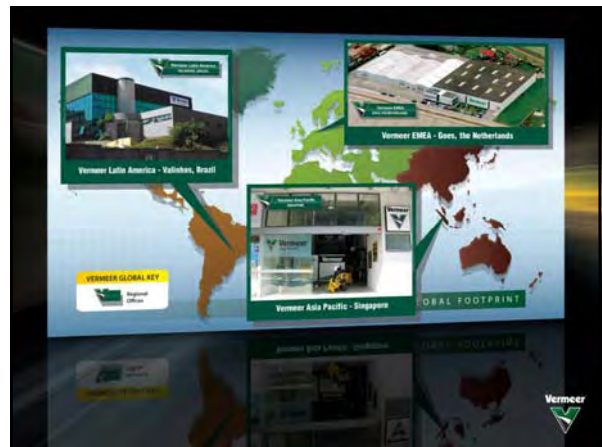
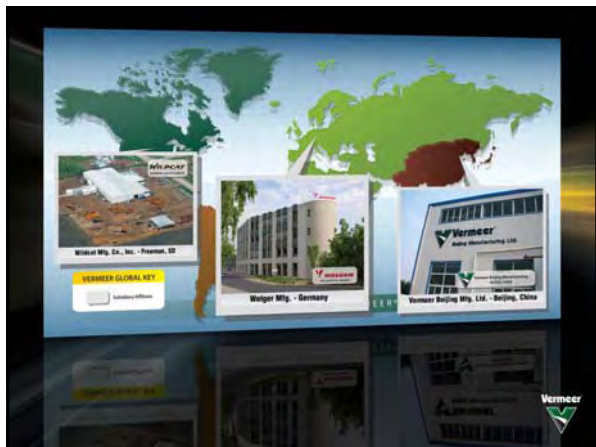
OUR FOUR (4) BUSINESS SEGMENTS

Creating Solutions

- Forage
- Environmental
- Underground
- Specialty Excavation







OUR GLOBAL TEAM

2,338 Total Employees

- Pella - 1,805
- Europe, Middle East, Africa and CIS the Netherlands (EMEA) - 30
- Vermeer Asia Pacific (VAP) - 5
- Vermeer Beijing Manufacturing Ltd. (VBM) - 75
- Vermeer Latin America (VLA) - 12
- Wildcat Mfg. Co., Inc. - 53
- Welger - 358

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GLOBAL DEALERSHIP NETWORK

Taking Care of Our Customers

Vermeer products and solutions are backed by a global independent authorized dealership network providing sales, service and parts.

Industrial Dealership Locations:
 Domestic - 125
 International - 63

Forage Dealership Locations - 385

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THE VERMEER FOUNDATION

4P Philosophy

- Principles
- People
- Product
- Profit

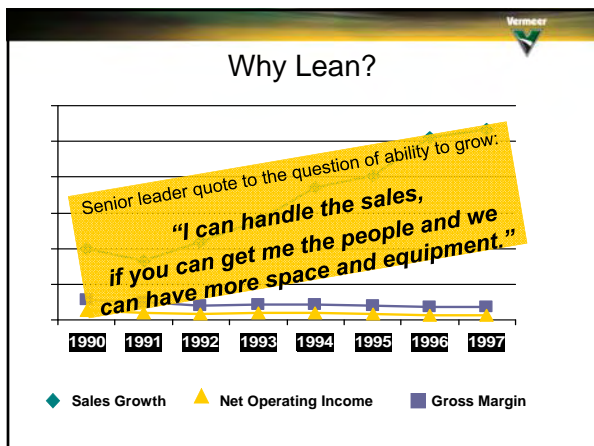
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VERMEER POLICY DEPLOYMENT

Striving for Success in 2010

The Vermeer Policy Deployment is built upon the foundation of the 4P Philosophy. Each piece is vitally important in achieving the company's overarching goal of taking care of customers worldwide with better solutions.

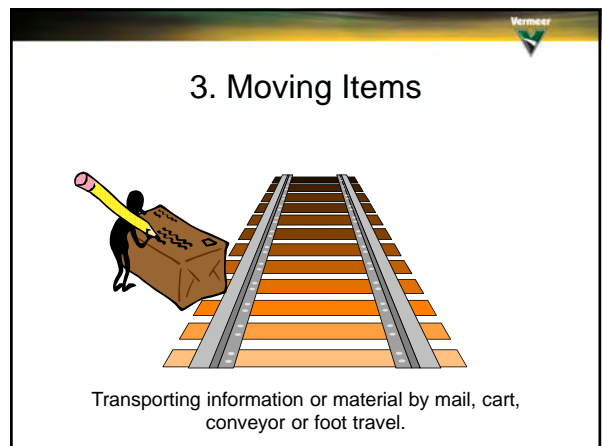
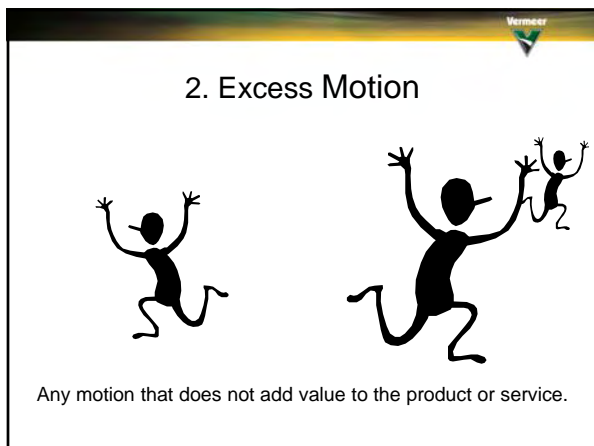
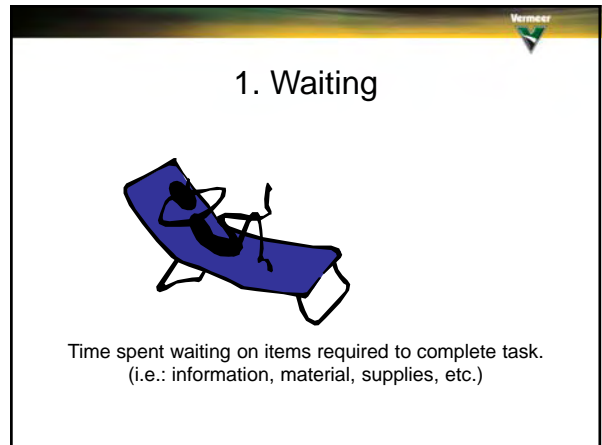
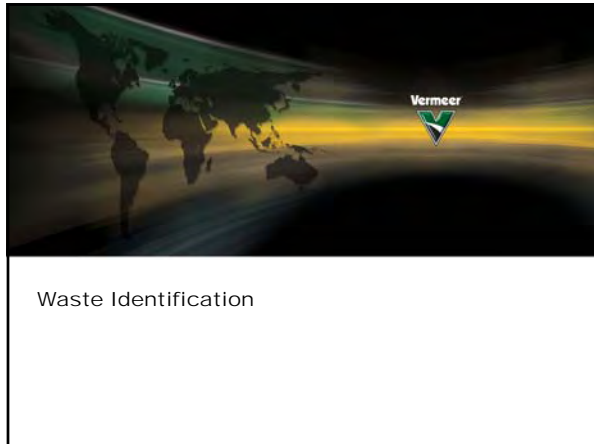
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Lean Toolbox

- Waste Identification (STOP WM D)
- Workplace Organization
- Visual Management
- TPM (Total Productive Maintenance)
- Standard Operations
- Value Stream Mapping
- Policy Deployment

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4. Fixing Defects




Time spent repairing or reworking material or information.

5. Overproduction




Producing more information or product than the ultimate customer requires.

6. Inventory



Material or information that is waiting for processing.

7. Overprocessing

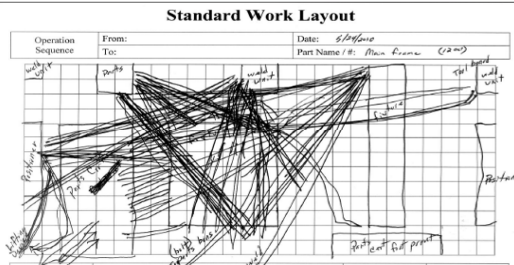


Effort and time spent processing information or material that is not adding value.

Waste Elimination (Mainframe)

Standard Work Layout

Operation Sequence	From:	Date: 6/14/10
	To:	Part Name / #: Main Frame (220)



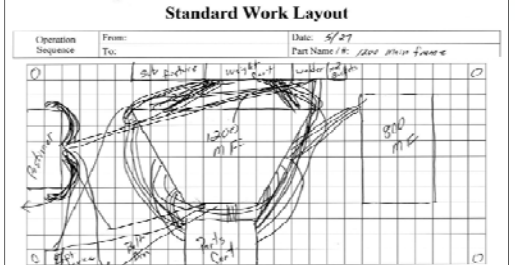
Quality Check	Safety Precaution	Standard WIP	# Pieces of WIP	Takt Time	Cycle Time
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 Page 1 of 1

Waste Elimination (Mainframe)

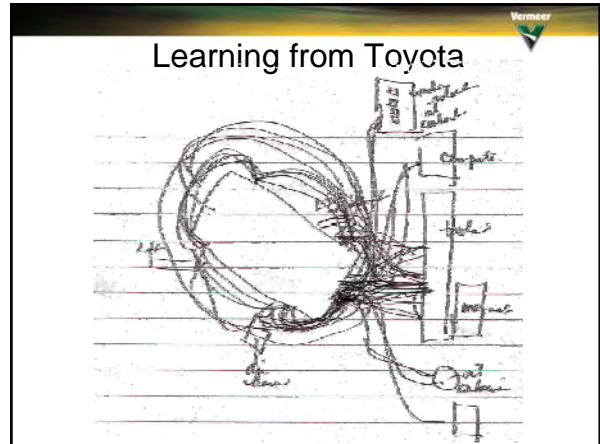
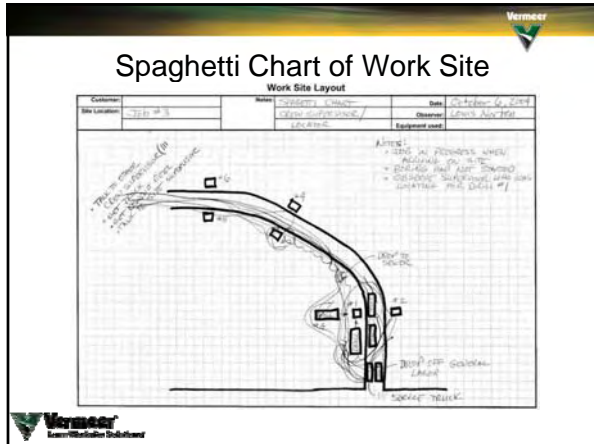
Standard Work Layout

Operation Sequence	From:	Date: 5/27
	To:	Part Name / #: 1200 Main Frame

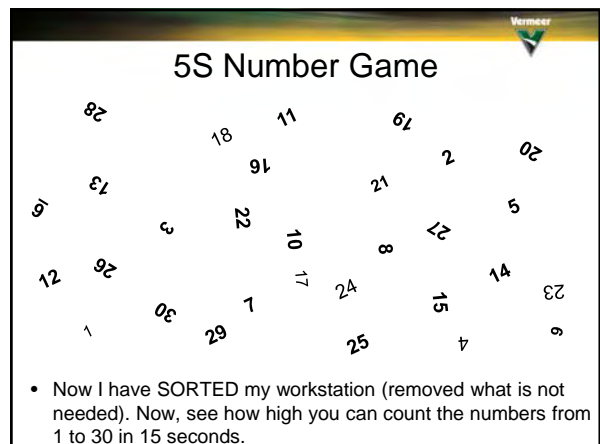
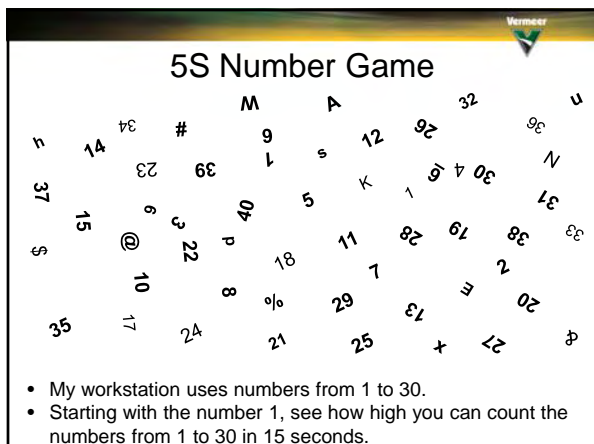
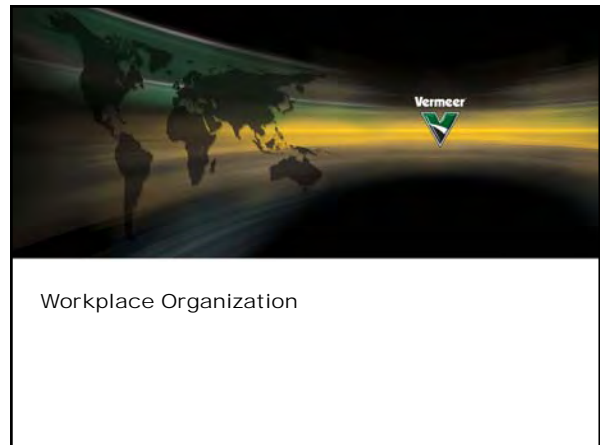


Quality Check	Safety Precaution	Standard WIP	# Pieces of WIP	Takt Time	Cycle Time
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- ### Learning from Toyota
- Service technicians never leave the bay
 - Parts brought to bay at appropriate time
 - Continuously improve flow around vehicle
 - Bay utilization metric
 - Consistent training
 - Use visuals (blinking light)
 - Always room for more improvement



5S Number Game

1	14	4	2	12	26	30	
3	23	9	16	5	<u>6</u>	19	
15	22	8	18	11	7	28	20
10	17	24	21	29	25	13	27

- Now I have SET (SIMPLIFIED) my workstation (straightened and right side up). Now, see how high you can count the numbers from 1 to 30 in 15 seconds.

5S Number Game

1	2	3	4	5	6	7	
8	9	10	11	12	13	14	
15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30

- Now my workstation is STANDARDIZED (in sequence and same size). See how easy it is to count the numbers from 1 to 30.

5S Number Game

1	2	3	4	5	6	7	
8	9	10	11	12		14	
15	16		18	19	20	21	22
23	24	25	26		28	29	30

- Now that my workstation is 5S'ed. What numbers are missing? See how easy it is to recognize abnormalities and SUSTAIN when your workstation is 5S'ed.

5S Number Game



- How difficult would it be to identify the missing numbers in the current condition?

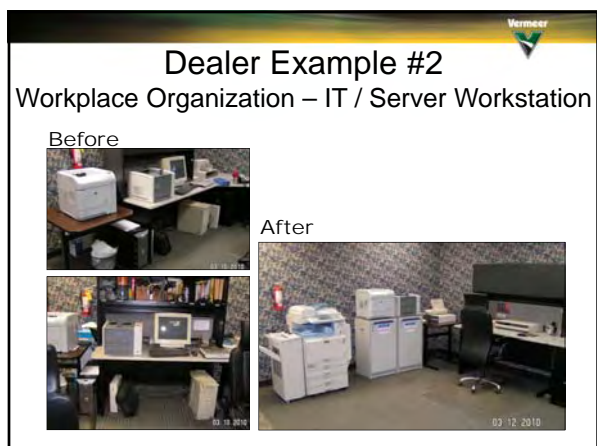
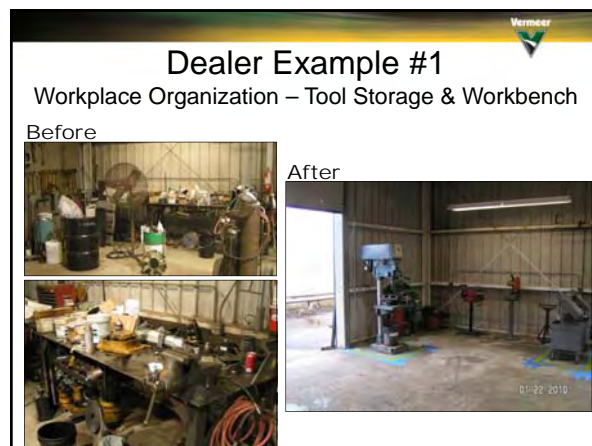
Lean Tools – 5S

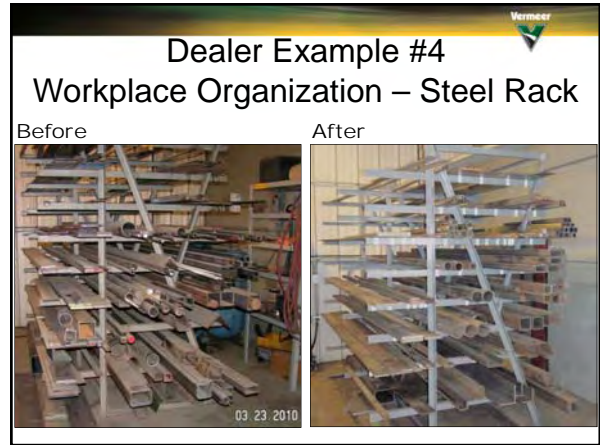
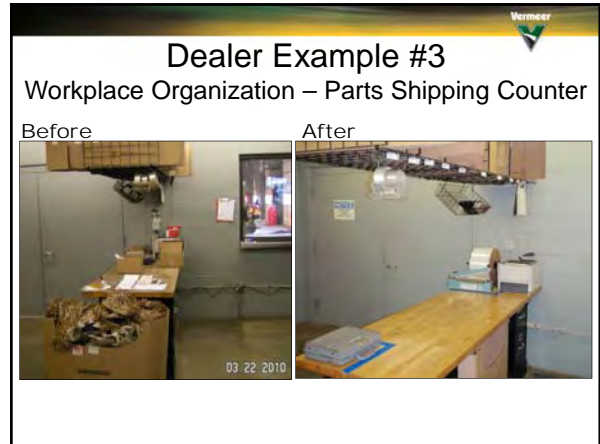
- “A method for creating & maintaining an organized, safe and clean environment.”
- 5S
 - Sort
 - Set in Order
 - Shine
 - Standardize
 - Sustain

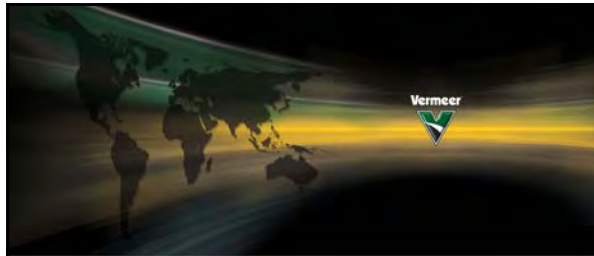



Lean Tools – 5S

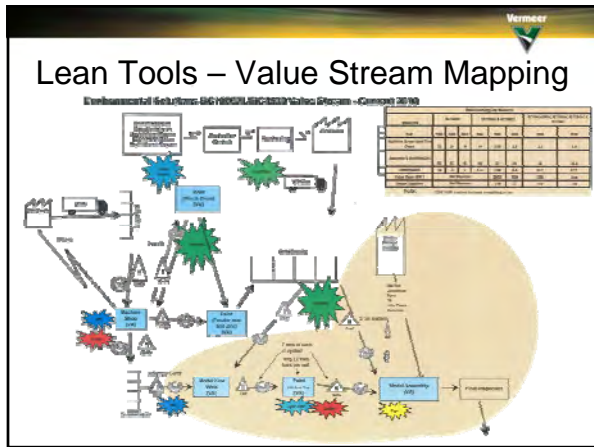




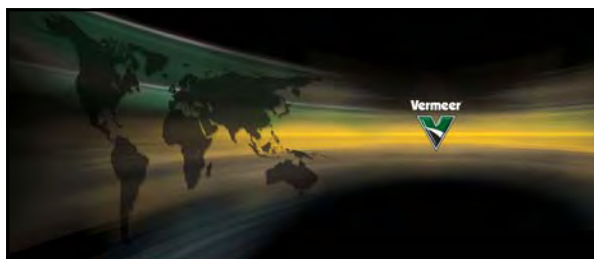
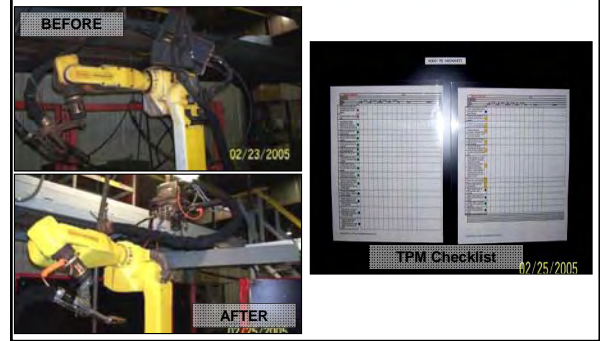


Visual Management / TPM

Lean Tools – Visual Management



Lean Tools – TPM Total Productive Maintenance



Model Line

Vermeer Kaizen Activity Through June 4, 2010

- Total Kaizen Events = 1,959
 - Shopfloor 1,230
 - Business Process Improvement 346
 - DLS/3P 148
 - MDI 41
 - 2P 39
 - Market Based Strategy 37
 - Dealer 44
 - Lean Sigma 10
 - Supplier 7
 - Lean Worksite 4
 - Others 53

Model Line Value Stream

Beginning January 2005

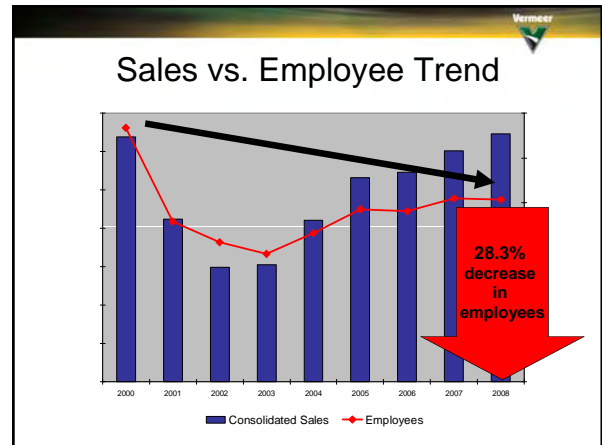
- Total Kaizen Events = 25
 - Assembly 5
 - Machine Shop 4
 - MDI 6
 - Paint 3
 - RTY 1
 - 2P / Engineering 3
 - Welding 3

Mixed Model Line

Model / Learning Line Measures

	Model Mix							
	BC1000XL			BC1000XL & BC1500XL			BC1000XL (49s), BC1000XL, BC1200XL, & BC1500	
Year	1999	2000	2002	2004	2006	2008	2009	2010
Mfg Value Stream Lead Time (Days)	52	24	14	14	5.89	2.5	2.5	2.5
Assembly & Weld Hrs/Unit	80	67	40	44	31	24	30	28.4
Demerits/Unit	10	3	3	8.72	7.89	4.4	RTY	RTY
Value Stream WIP \$	Not Measured			\$243K	\$103K	\$128K	Aug	
Unique Suppliers	Not Measured			119	77	110	110	

Note: \$128K WIP number includes everything, but physical inventory was taken during the launch of the BC1000-49 hp & the BC1200. We had additional WIP on line due to the new product launch. This number will be back to normal at our next physical inventory in August.

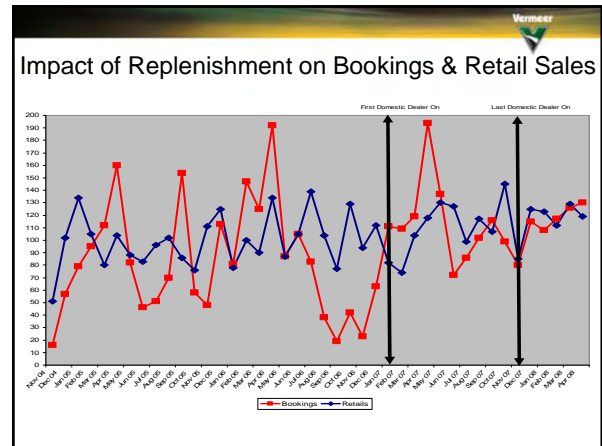
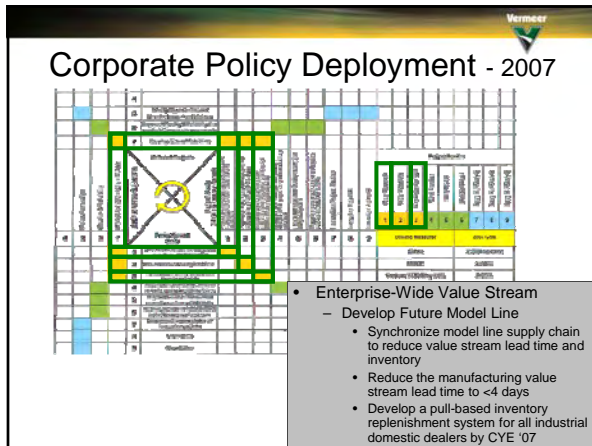


Lean Results

Percentage Increase/Decrease

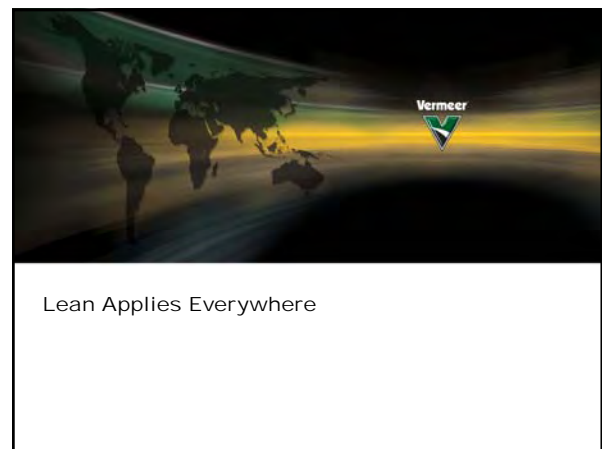
Category	1998 vs. 2008	2000 vs. 2008
• Employees	23% ↓	28% ↓
• Production Employees	44% ↓	42% ↓
• Total Inventory	15% ↑	28% ↑
• Work In Process	43% ↓	2% ↑
• Cash	67% ↑	51% ↑
• Sales	28% ↑	1% ↑

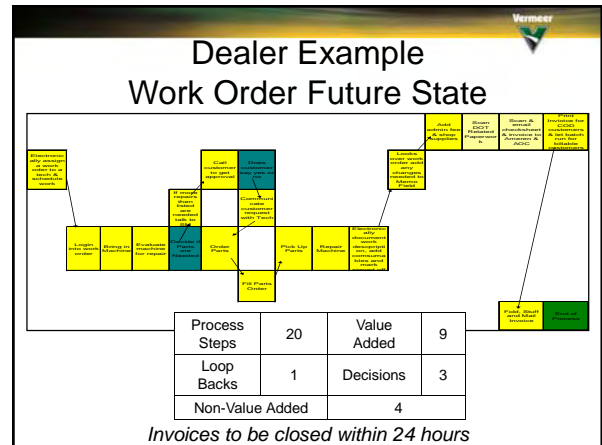
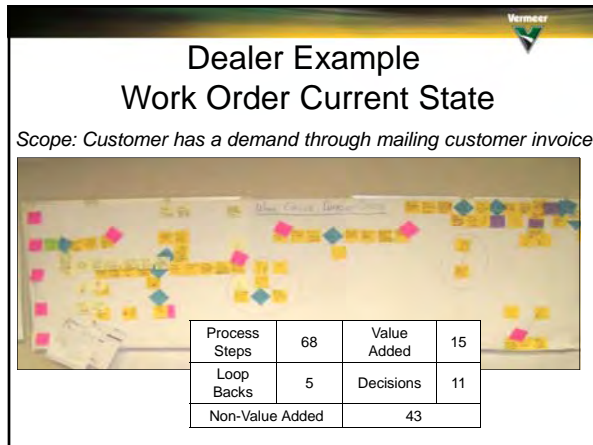
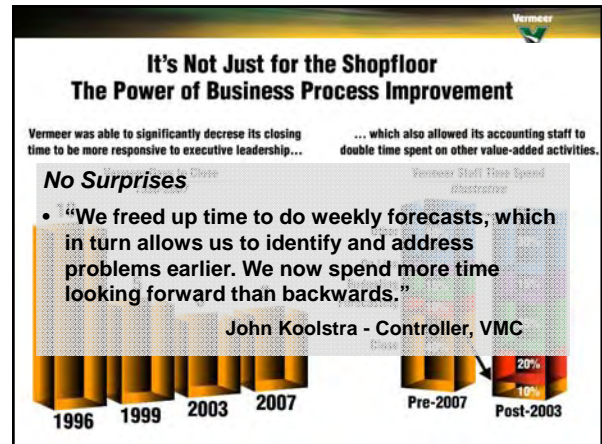
Policy Deployment / Replenishment



- ### Results
- All domestic dealers are sourcing these models through replenishment
 - 8-week retail supply (dealer) / 4-week retail supply (Vermeer)
 - Lead-time reduction:
 - Prior average lead time – 76 days (110 days max)
 - Current lead time – 1 day RTS / 9 days complete cycle
 - Inventory Turns:
 - Prior turns: 2.5 turns
 - Current turns: 4.04 turns
 - Currently have 17 models on the program
 - 75% of our units – 45% of our revenue
 - Dealers asking for more product on program

- ### Dealer Results
- Dealer #1 (Model Dealer)
 - “Retail-driven orders practically eliminate the backlogs and allow us to respond to local spikes in demand.”
 - Saved 8-10 hours / month order placing
 - Saved 25-30 hours / month moving equipment
 - Dealer #2
 - “...we struggled keeping the right inventory on hand for the business we do. We were reacting by “stocking up,” placing bulk orders on chippers or drills. The result was that we had too many or not enough.”
 - Freight cost before replenishment - \$795/unit
 - Freight cost after replenishment - \$625/unit
 - Total savings on one model = \$6,000/year
 - Saved 8-10 hours / month managing chipper inventory
 - “Please continue doing what you are doing to keep the peaks and valleys out of dealer inventory.”





Dealer Example Results Achieved

Improvement Measure	Before Kaizen	Kaizen Obj. (% Imprvmt)	Actual Achievement	% Improvement
Total Steps	210	50%	97	54%
Loop Backs	13	75%	2	85%
Non-Value Added	118	75%	24	80%
Necessary Non-Value Added	69	25%	46	33%
Decision Points	25	50%	10	60%
Standard Process	None	Document Processes & Select Pilot	Complete	100%


- ### Dealer Example – Takeaways
- We are going to save some trees
 - Once implemented we will save a lot of time and money
 - **There are a lot of processes that we can standardize across all stores**
 - It is so easy to see the waste when it is put in this visual way
 - We can be more mindful of waste in all of our processes
 - **We have created a mindset change, “Because we have always done it that way”**
 - This can be shared and carried over to other dealerships
 - It was awesome the way multiple locations shared and worked together
 - **We knew we could improve these processes but couldn't see how. It was so easy to see how once we mapped it out.**
 - We make our jobs more complicated than we need to
 - **We created a way to have easier access to information**

Iowa Department of Natural Resources (DNR)

- Air Quality Construction Permits
 - Progress: 23 steps to 7 steps
 - 70% decrease
 - Handoffs: 18 handoffs to 4 handoffs
 - 70% decrease
 - Time: 62 days to 6 days
 - 90% decrease

University of Iowa

- Infusion Therapy – Cancer Clinic
 - Wait time from 32 minutes to 10 minutes
 - 70% decrease
 - Overall length of stay: from 235 minutes to 186 minutes
 - 21% decrease
 - Throughput: 42 patients/day to 68 patients/day (same staff)
 - 61% increase
 - Staff 900 ft. traveled/patient to 90 ft. traveled/patient
 - 90% decrease




Lean and Green

Lean & Green

<p><u>7 Lean Wastes</u></p> <ul style="list-style-type: none"> • Overproduction • Waiting • Transport (Conveyance) • Overprocessing • Excess Inventory • Excess Motion • Defects 	<p><u>7 Green Wastes</u></p> <ul style="list-style-type: none"> • Energy > • Water ~ • Materials ☁ • Garbage 🗑 • Transportation 🚚 • Emissions 🏭 • Biodiversity 🌿
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Learning to See Green



- What is broken?
- Where are the energy pigs?
- Look for bottlenecks and inventory.
- Look for noise, dirt, accumulation and erosion.
- Where is there smoke and pollution?

Learning to See Green

Look for the 3 R's in EVERYTHING we do!

<p><u>7 Green Wastes</u></p> <ul style="list-style-type: none"> • Energy > • Water ~ • Materials ☁ • Garbage 🗑 • Transportation 🚚 • Emissions 🏭 • Biodiversity 🌿 	<ul style="list-style-type: none"> • Reduce • Reuse • Recycle
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Lean and Green 2008 Recycling Kaizen Event



Before Kaizen:

- No defined recycling procedures
- Numerous trashcans and few recycling containers (*convenient to waste / inconvenient to recycle*)
- 70% of the trash (in the manufacturing areas) was material that could be recycled



Lean and Green 2008 Recycling Kaizen Event

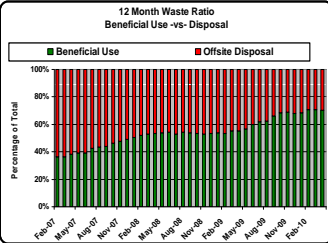


After Kaizen:

- Well-defined recycling procedures & site-wide training
- Centralized recycling collection center
- Numerous recycling containers and fewer trash cans (*convenient to recycle / inconvenient to waste*)



Lean and Green 2008 Recycling Kaizen Event



Results Achieved:

- Implemented site-wide recycling program and completed training in all areas
- Reduced offsite disposal by **762 tons/yr** to achieve **71%** beneficial use for all wastes generated on campus (29% landfill)
- Increased recycling approximately **20%**; saved **\$230,290/yr** from total waste disposal fees and recycling credits
- Implemented PPE laundering & reuse process and saved **\$43,400/yr** in replacement & disposal costs
- Integrated recycling into weekly 5S audits

Lean and Green Water Conservation

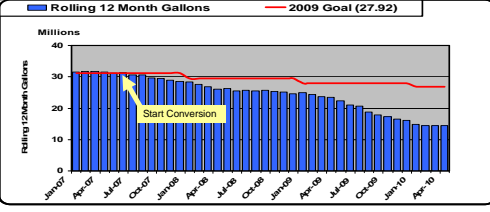
Process Improvement

Process description: Steel washing systems remove surface impurities from steel parts and then coat them with a chemical undercoat that enhances paint adhesion

What we did:

- Converted** all automated washing systems from a phosphate coating to a zirconium coating process
- Re-routed** overflow from the final rinse into the up-stream rinse stages
- Eliminated** heated water from the process which significantly reduced natural gas consumption and associated air emissions
- Improved** several processes in our PWTP that have virtually eliminated tap water usage in the plant (*pH adjustment, filter back flush, better PM activities*)

Lean and Green Water Conservation

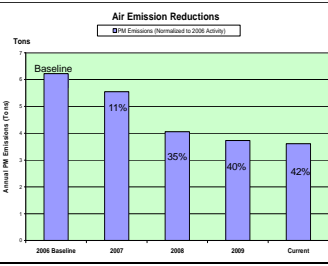


Prior to project: Vermeer previously discharged 32.0 MMG/yr in 2006

2008 results: Reduced total water usage by 20% and saved \$54,500/yr from water fees and treatment costs

Current results: Implemented additional water reduction improvements and reduced total water usage by 55% at a savings of \$114,500/yr

Lean and Green Air Emission Reductions




Results achieved:

- Reduced PM (particulate matter) emissions 42% from 6.2 tons per year to a current rate of 3.6 tons per year
- Retrofitted existing steel cutting equipment with PM emissions control equipment such as bag-house filtration and water-table fume collection
- Replaced conventional metal arch welders with Pulse metal arch welders
- Eliminated numerous old-technology flame cutters and replaced with only a few new-technology laser cutters

5-Year Vision Environmental Metrics (2007 thru 2011)

- ☑ Reduce Total Landfill Waste 30% by 2011
 - Total waste has been reduced 32% from our 2006 baseline.
 - Approximately 71% of our total waste is currently being used for a beneficial purpose rather than disposal.
- ☑ Reduce total water used 15% by 2011
 - Total water usage has been reduced by 55% from our 2006 baseline.
 - Additional water reductions from several process improvements are anticipated this summer.
- ☑ Reduce PM10 emissions 600 lbs by 2011
 - PM emissions have been reduced by 42% from our 2006 baseline as a result of new welding and cutting equipment with better emission controls.



Change in Culture

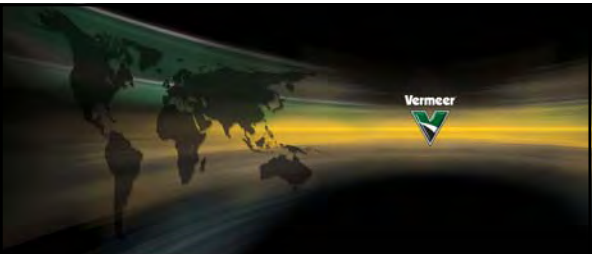
Lean Participation 2000 Employee Survey

Number of Events	0	1 - 2	3 - 5	6 +
Supervision	-3	3	8	13
Employee Involvement	-4	3	14	16
Career Advancement	-1	0	7	13
Job Satisfaction	-2	0	11	14
Customer Focus	-3	2	12	14
Kaizen Initiative	-6	7	14	27


Lean Participation 2007 Employee Survey

Number of Events	0	1 - 2	3 - 5	6 +
Leadership	0	-2	0	4
Employee Involvement	-3	-4	3	13
Training and Development	-1	-3	5	5
Working Conditions	-1	-2	1	6
Customer Focus	-5	-1	3	9
Lean Methodology	-10	-1	3	18

Ask the 5 Why's


Challenges and Learnings



Why Unsuccessful?

- Lean is NOT robust; it is fragile.
- It needs constant feeding and watering and reinforcing and scrutiny.
- There is no automatic pilot for lean.
- One-piece flow runs counter to generations of managers who thought only about overhead absorption.
- Lean is hard; it requires great consistency and it takes time.
- Empowering employees can be scary, for both bosses and employees.


"Ransom's Ruminations"
Clifford F. Ransom II



Lean IS

- A Change in Culture
- Employee Involvement
- Relentless Pursuit of Waste

**Lean is common sense,
uncommonly applied.**



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