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About Myself

- Machine Operator for 3 years
- Setup Technician for 1 year
- Maintenance Technician for 7 years
- Maintenance Lead for 3 years
- Assistant Facilities Manager for 3 years
- Maintenance / Facility / Tool Room Manager for 13 years

Eator	n Corp. Eden Pra	airie Facility
Location	Eden Prairie, MN	Com.
Products	Spool Motors & Steering Control Units	
Size/Employees	233,000 sq. ft. 243 Employees	
Typical Processes	CNC Turning / Grinding / Lapping; Heat Treat / Assembly / Painting	
Manufacturing Environment	Low Volume, High Mix	, (0)

Definitions

- Breakdown / Reactive Maintenance Waiting for equipment to fail before repairs or service is done
- Preventative Maintenance (Time Based) scheduled periodic inspections, cleaning or part replacement. (Predictive) Based on hours, analysis tools or monitoring devices.
- TPM Total Productive Maintenance: This is a holistic approach to maintenance that involves operators, maintenance and engineers
- AM Autonomous Maintenance (operator level maintenance)

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Starting he TPM / PM Journey

- Do you have the culture to succeed
- Have you identified your critical equipment
- Who is driving this initiative
- How much time do you have for the event







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Building a TPM / PM culture is a journey

- It will not happen quickly My Journey
- 2004 Fix as fail / no support from leadership
- 2006 New leadership, some support. 100% reactive. PM system is just getting started
- 2008 Operators start seeing benefits of PM and asking supervisors for PM on their equipment



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Na	
ocus Site	Event Dates:
eliminary Objectives:	
I	
oduction Requirements (Takt Time):	
ocess Information:	Current Situation and Problems
1	
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	R		PROGRE	SS TARGE	T SHEET			
Department Number:				Team No.:			Date:	
Focus Site						Takt Time	:	
	Start	Target	1st Day	2nd Day	3rd Day	4th Day	Difference	% Increase Decrease
Space (Sq. Ft.)								
Inventory (pcs)								
Walking Distance (ft)								
Parts Transport Distance								
Throughput Time								
Cycletime								
Volume Per Day								
Full-time Equivalent Crew								
Productivity								
Changeover (Total)								
Schedule Attainment								
Safety Improvements								
Quality Improvements								
Remarks:								
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PM / AM Setup

- Use the RIE to develop or enhance the PM as well as the AM program.
- Use the operators to help build the AM program.
- Create a visual AM check list so it can be monitored.
- What is not measured or monitored will not get done.

















TORO.

- Headquarters in Bloomington, MN
 - Founded July 10, 1914, celebrated 100 years in 2014!
 - Employees 6,800 (10/2016)
 - Revenues \$2.4 billion (10/2016)
- Innovative solutions for the outdoor environment including
 - Turf, snow, ground-engaging equipment, irrigation & outdoor lighting
- Strong network in over 90 countries
 - Golf courses, professional contractors, groundskeepers, agricultural growers, rental companies, government and educational institutions and homeowners



TORO

TORO.

Total Productive Maintenance

- Maintenance created TPM BOOKS for each machine
 - Checklist for operator to do
 - photos
- TPM books located by machine
- Operators performed TPM

TPM 1st Wave (2006)

- Simple operator check off with space for comments
- Failures:
 - Books were cumbersome
 - Operators disagreed with checklist
 - Poor supervisor/manager follow-up
 - Preventative Maintenance program in infancy



TORO

TPM 2nd Wave (2008)

- Training on 5S & TPM
- Visual Machine Methodology
- Started with one critical work center
 - 1 page TPM (double sided) with TPM check sheet
- · Operators and maintenance involved all shifts
- One champion per machine-group lead
- Layered process audits (leads, supervisors, managers)

































3M at a Glance (Year-end 2016)

- \$30.1 billion Global Sales
- \$17.9 billion International (non-US) sales (60 percent of company's total)
- \$1.74 billion R&D investment
- \$1.42 billion Capital investment
- \$60+ million 3Mgives cash and product donations
- 668 U.S. Patents; 3,770 Total
- · 200 countries where 3M products are sold
- 70 Countries 3M Operations
- 91,584 employees globally.



3M Technology Advancing Every Company 3M Products Enhancing Every Home 3M Innovation Improving Every Life

Who We Are: A Global Innovation Company

3M is a global innovation company that never stops inventing. Over the years, our innovations have improved daily life for hundreds of millions of people all over the world. We have made driving at night easier, made buildings safer, and made consumer electronics lighter, less energyintensive and less harmful to the environment. We even helped put a man on the moon. Every day at 3M, one idea always leads to the next, igniting momentum to make progress possible around the world.





3M

























































	Maintenance Conscious Engineering	
	Are We Enhancing?	
Engag Spare F	ing Plant Engineering in the Machine Design, Build, and Qualification Process, incl Parts and Standardization to Effectively Minimize the Total Long Term Maintenance	uding Costs
	Do We Have Full Participation in all Phases of New Capital Equipment, especial the early stages?	ly
	Do We Have Strong Relationships with Engineering Groups such that our con and ideas are heard and taken into consideration for future projects?	ncerns
	Do We Know What Steps We Need to Take to Improve this Process?	











Workshops

Accountability Systems May 16

Quality System Development May 17

Frontline Leaders Role in Hiring May 18

Conflict Comm. Collaboration May 31

Standard Work June 7

Lean Manufacturing Simulation Half-day format on June 13

Certifications

Lean Practitioner Certification Next series starts May 23

Lean Leader Certification Ongoing

Six Sigma Green Belt Certification Next series starts July 12

Supervision Fundamentals Certification Next series starts July 13

Flyers on the back table!

