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14 Steps of a Preventive Maintenance Optimization (PMO) Process

Ricky Smith, World Class Maintenance

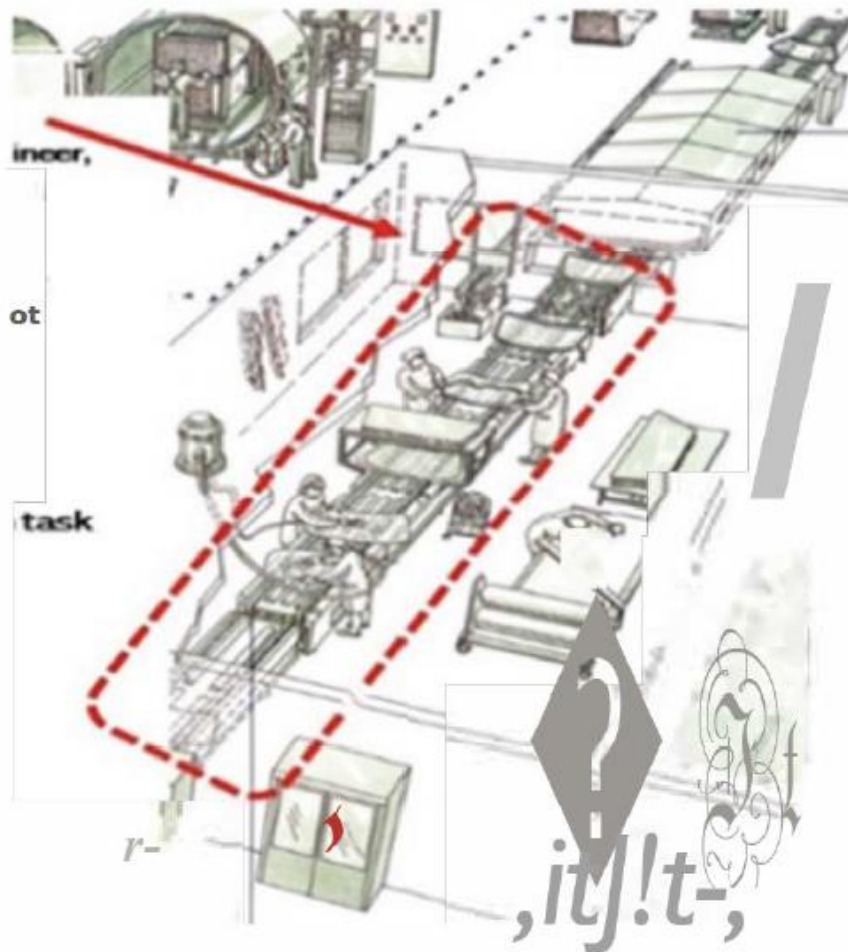


The article outlines a comprehensive 14-step process for optimizing preventive maintenance (PM). This methodical approach ensures a thorough and effective PM optimization process, aiming for continuous improvement across assets and functional areas.

Step 1: Establish a baseline using current metrics or data from maintenance and production/operations.

Asset	PM Compliance "20% Rule"	Schedule Compliance	EM/Urgent Labor Hrs.	Maintenance Rework	Less than 6 Minute Stops
Chipper	56%	56%	232	32	14
Extruder	67%	75%	321	8	22
Septet	25%	34%	98	45	38
Crimper	88%	88%	74	12	23
Baler	45%	34%	129	38	18
Strapper	100%	100%	13	7	2

Step 2: Identify which asset/functional area the PM optimization will be executed.



Step 3: Identifying a cross-functional team (operator, maintenance tech, reliability engineer, planner, etc.).

Step 4: Establish expectations from everyone engaged in this process.

Step 5: Define the end goal of this process.

Step 6: Define roles and responsibilities for all members of the PMO team.

Preventive Maintenance
"Roles and Responsibilities"

Task ↓	Position →	Maint Mgr.	Rel Engr.	Maint Sup.	Maint Techs	Maint Planner	Prod Mgr.	Plant Mgr.
Create / Manage Asset Criticality		C	R	C	I	I	C	A
ID all Components		A	R	C	R	C	R	I
ID how each Component will Fail		A	R	C	R	R	C	
Write Repeatable PM Procedures		A	R	C	R	C	C	
Measure / Monitor PM Effectiveness		A	R	C	C	R	C	I
Modify PMs		A	R	R	R	C	C	I
Manage Maintenance Dashboard (Leading / Lagging KPIs)		A	R	R	I	C	I	I

Responsibility	<u>"the Doer"</u>	(could be more than one)
Accountable	<u>"the Buck stops here"</u>	(One person only)
Consulted	<u>"two-way communication"</u>	(in the Loop)
Informed	<u>"one-way communication"</u>	(kept in the picture)

Step 7: Define how you'll measure if the PM optimization process has been effective or not.



Equipment Block ID:			
Line 191			
Equipment Hierarchy: E60000, Segnet Process Line			
Project Description: Perform PM on Segnet Process Line			
Job Description: Perform PM on Hydraulic System			
Frequency: Monthly			
Estimated Craft Hours:	2 techs x 3.0 hrs	Estimated Elapsed Time:	3.0
Estimated Production Downtime:		3.0	
Originator:	Dave Shone	Origination Date:	03/12/2012
Owner:	Plant Maintenance	Version #:	1.0
Previous Version(s) Modifications:			
Approval:	DS	Version #:	1.0
Warnings: Failure to follow instructions could result in personal injury Cautions: Failure to follow procedure could result in early equipment failure			
Personal Protective Equipment Required: Gloves, face shield, hearing protection			
Part # (Notes I/O)	Part Description	Quantity	Quantity Description
#03214	Hydraulic Filter	2	Each
#03243	Tool: Wrench	1	Each
Consumables Needed: Degreaser, list free thread seal seal			
Special Tools Required: 1 "Torque Wrench			
Mobile/Special Equipment: None			
Required Departmental Coordination: Production Line shutdown / Hydraulic Cylinder Extended / One Operator to Assist Maintenance Other Procedures Referenced: Job Preparation / Lockout Procedure #000			

Step	Description	Craft	# of Crafts	Clock Hours	Craft Hours	Craft Initials
1	Inspect Hydraulic System Running • Does the Pressure fluctuate more than 5psi? Yes / No • Number of Hydraulic Leaks	Mech	2	.5	1.0	
2	Caution: Failure to Clean inside reservoir will result in premature valve failure Clean inside Reservoir with Lint Free Rags	Mech	2	.25	.5	
3	Replace Hydraulic Filters (2)	Mech	1	0.3	0.3	
4	Torque Fasteners on Filter Fasteners to (					
4	Replace Zinc Anode on Water Gooled Heat Exchanger	Mech	1	.5	.5	
5	Inspect 5 Hydraulic Hoses for water or leaks • Hoses 1-1 Yes / No • Hoses 1-2 Yes / No • Hoses 1-3 Yes / No • Hoses 1-4 Yes / No	Mech	2	1	2	
6	Inspect Hydraulic Cylinder for Leaks • Inspect Rod Seal for Leaks (Circle One) • No Leaks • Wiping Oil • Oil Shroud • Inspect Rod Yoke for break in thread seal on threads Break? Yes / No	Mech	1	0.3	0.3	
7	Inspect all work after production is up to rate "Do not leave equipment until production is up to rate"	Mech	2	.5	1.0	
TOTAL Hours				4.25	7.0	

Comments / Findings:

Craft's Feedback on Procedures:

Craft's Signature(s):

Date:

Page 3 of 3

This includes:

- ## Step 10: Review current PMs and PdMs for these reasons:

- PM procedure may need to be rewritten
- Training may be required
- PM frequency may be inaccurate and need adjustment
- Checking if equipment is in "maintainable condition"

Step 11: Rewrite PMs or write new PMs (ensure they are repeatable).

Step 12: Monitor and measure to ensure new PMs are effective and adjust as needed.

Step 13: Post results for all to see.

Reliability Dashboard by Asset - Gypsy Paper

Line Assets	# Failures	Production Losses	EM/Urgent Labor Hrs.	PM Compliance Using 10% Rule
Board Infeed	12	32	47	100%
Press Unit	0	0	14	100%
Total	12	31	61	100%

Maintenance Scorecard			
	Best practice	10/12/2020	YTD
Maintenance Schedule Performance	>70%	62%	67%
Maintenance Break In Work	<15%	38%	33%
PM/PDM Work Scheduled	> 30%	18%	35%
PM/PDM Compliance	>80%	36%	67%
Notification Entered from PM/PdM find	1 for every 6 inspections	2	3
Equipment Not Available	Weekly	0	1.45
P1 Notifications	Weekly	12	11.43
Core Shift Mechanic	Weekly	4	3.95
Polymer Shift Mechanic	Weekly	9	6.22
No Information P1's (Still open)	Weekly	0	1.55
		Shift & Core worked on 1 P1 together	

Step 14: Once concept has been proven move to the next asset/area.

PM Optimization Results Example:

PM Task Action Recommendation	# of Tasks	% of Tasks	Man-Hours Represented
Non-Value Added (Delete)	1,640	8.2%	6,661
Reassign to Operator Care	1,380	6.9%	5,605
Reassign to Lube Route	2,856	14.3%	11,600
Replace with PdM	6,437	32.2%	28,222
Reengineer	5,200	26.0%	26,221
No Modifications Required	2,487	12.4%	8,987
Totals	20,000	100.0%	87,296

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About the Author



Ricky Smith

Ricky has over 30 years' experience working as Maintenance and Reliability Professional for companies such as Exxon Company USA, Alumax Mt Holly, Kendall Company and the US Army. In additi... [Read More](#)

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