



FLUKE®

Reliability

**So your planner doesn't
plan?**
**How to move away from
unplanned maintenance**

Shon Isenhour

Accelix™
Webinar Series



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Partner, Eruditio

- Engineering graduate of North Carolina State University
- Past National Chairman of the Society of Maintenance and Reliability Professionals (SMRP) and past Vice President of Membership and Programs for the South Carolina Midlands chapter of the American Society for Training and Development (ATD, formerly ASTD) and Past Vice Chairman of World Partners in Asset Management (WPiAM)
- Certified Maintenance & Reliability Professional (CMRP) and Certified Asset Management Assessor (CAMA)
- Experienced in industries such as primary metals, mining, pharmaceuticals, petrochemical, chemical processing and paper



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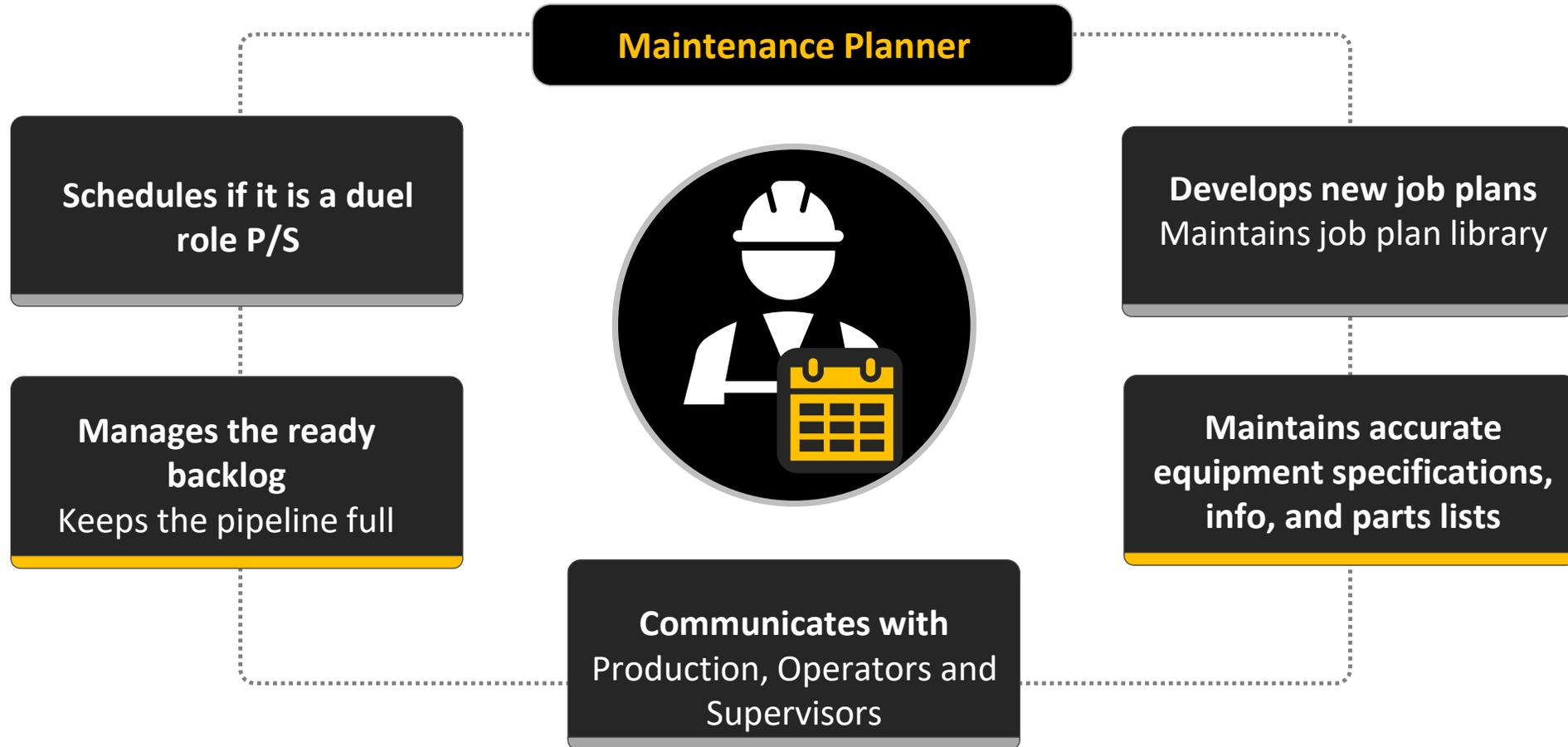
Training, Consulting, and Magic



Why This? Why Now?

- 3% Can Say They Do It Well...
- Lack of Planning Significantly Reduces Effectiveness of Maintenance, and Reliability
- Safer, Faster, Cheaper, Better Quality
- Backbone of Real Results
- Tripping the Breaker
- Restart Right!
- Have a Plan

Roles and Responsibilities



A Maintenance Planner Does *Not*



Plan emergency work



Expedite parts



Act as a relief supervisor



Maintain a storeroom



Act as a clerk



Perform the buyer function



Pick up the tools and fill in



Engineer (Design) Jobs

Not the plant engineer Or plant engineer's assistant

POLL QUESTION No. 1



Based on the last two slides, how many of you feel you indeed have a functioning planner? (Click only one answer)

- Yes, we do!
- Mostly we do
- Some of the time we do
- Sorry, but we don't at all

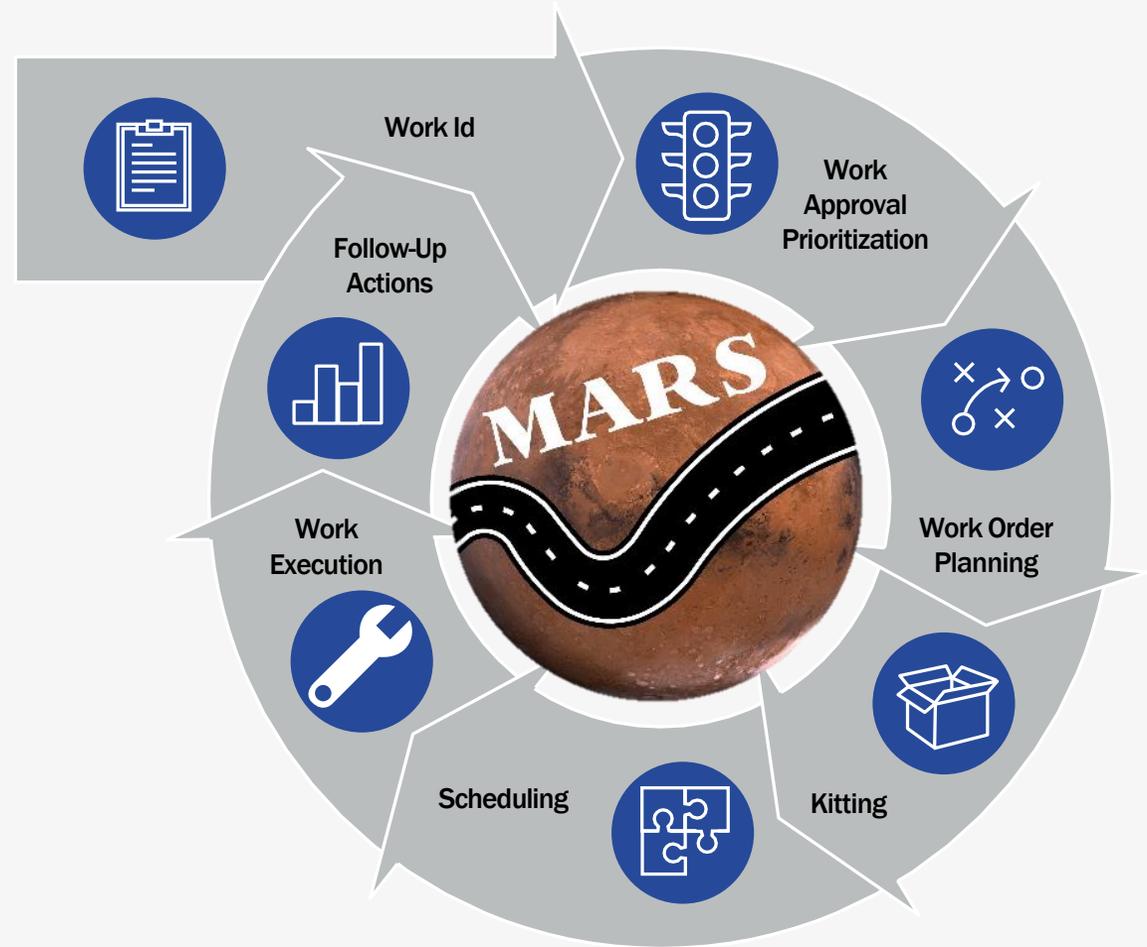
10 Things

- 1 Work Execution Business Processes
- 2 RASI or RACI
- 3 Step Text
- 4 Planner and Scheduler Job Descriptions Built from RASI or RACI
- 5 CMMS or EAM Usage Expectations for All Affected

- 6 Job Plan Library Expectations
- 7 Job Plan Expectations with Precision Maintenance Standards
- 8 Scheduling Template
- 9 Bill of Material Expectations
- 10 Kitting Expectations

Processes

- Mega vs Micro
- Explain the Fit
- Teach Their Micro

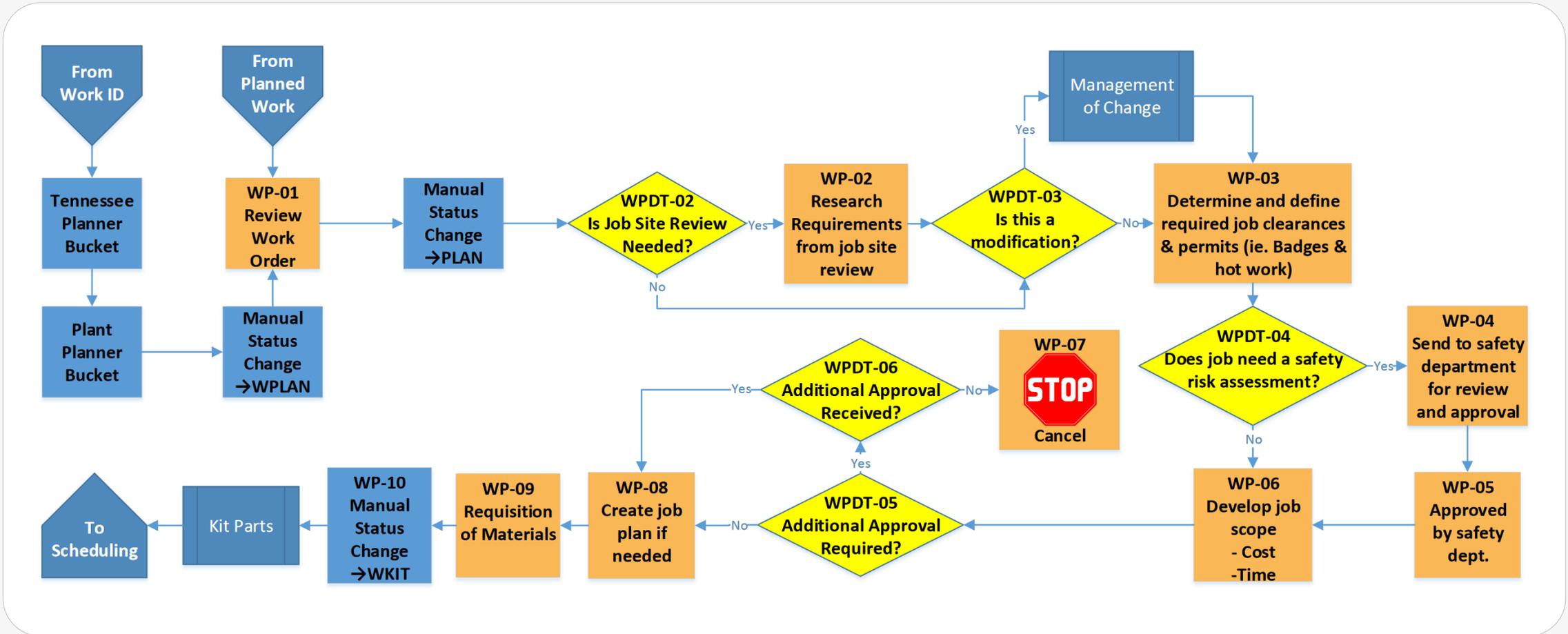


Work Management

Core Beliefs

- 1 Planners remain focused on FUTURE WORK
- 2 Planners do not chase parts for jobs in progress
- 3 Supervisors and crew leads handle the current day's work and problems
- 4 Faced with the choice, a line supervisor must concentrate on today's problems rather than work on future (even tomorrow's) activities
- 5 There is no such thing as a perfectly planned job
Continuous improvement is a must
- 6 All stakeholders must share the same priorities
Active communication on priorities is an absolute requirement

Work Planning Process



RASI or RACI

MARS Roles and Responsibilities Matrix																			
Work Process Block Number	Definitions	Notes																	
	R - Responsible	Completes an action / authors a deliverable / decision-maker																	
	A - Accountable	Ensures actions occur / Ultimate decision authority																	
	S - Support	Consulted / contributes to actions / provides information																	
	I - Informed	Notified when actions occur																	
	<i>Work Execution</i>	Maint - Manager	Maint - Clerk	Maint - Worker	Maint - Technician	Maint - Planner	Maint - MIT	Maint - Mechanic	Maint - Supervisor	Maint - Superintendent	Maint - WCM	Maint - Engineer	Maint - Reliability Engineer	Prod - Operator	Prod - Material Handler	Prod - Technician	Prod - Assistant Supervisor	Prod - Supervisor	Prod - Superintendent
	Work Execution																		
WE-1	Daily schedule status review				I		I	I	R	A				I		I	I	S	S
WE-2	Review job scope (Safety Meeting)			SI	SI		SI	SI	R	A				I	I	SI	SI	R	A
WE-3	Begin work execution				R		R	R	A					S	S	S	S	S	S
WE-4	Determine if additional materials are needed				R		R	R	A										
WE-5	Note additional materials needed				R		R	R	A										
WE-6	Were additional materials available?				R		R	R	A										
WE-7	Can work be completed per schedule?				S		S	S	R	A						S	S	S	I
WE-8	Determine if follow up work is needed				R	I	R	R	A										
WE-9	<u>Create follow up Work Order</u>				R	I	R	R	A					I	I	I	I	I	
WE-10	Perform operational check				R		R	R	A						S	S			
WE-11	Was operational check satisfactory?				R		R	R	A	I		S	I		S	S	I	I	

Step Definitions

Planned Work Process Flow Definitions

PW-01 *****

PW-02 Maintenance Tech, Maintenance Supervisor Review Production schedule on a daily basis

- Maintenance Supervisor and Maintenance techs, and Production PMTs review the production schedule on a daily basis to find windows of opportunities to fit in small jobs out of the work package for the week. Such as changeovers.

PW-03 Maintenance Supervisor assigns jobs in the package to each craft person

- Maintenance Supervisor hands out the job package to individual mechanics, and Production PMTs as determined by best fit for the job, Line assignment, or to further training on a line or a specific piece of equipment.

PW-04 Notify Response Resources

- Work on a specific job begins by the mechanic or PMT, reviewing the job scope, and determining if any additional resources are needed that may not be called out in the job plan.
- Mechanic notifies anyone who might be impacted by the current job. I.E. Production supervisor if job could interfere with startup or is a modification to a piece of equipment.

Work ID: Work Process Flow Definitions

WI-01 Need for Work Identified

- General requests
- SSI
- PMs
- Safety/Food safety
- Alarms
- Breakdowns
- Modifications
- McKee Operating System/Lean Team

WI-02 Enter Work Request and input required information

- [Work Request Entry](#)
- Enter as much information into the work request as possible.
- Some fields are mandatory.
- Maintenance tech **MUST** enter suggested/required parts into the additional comments box on the work request.
- Maintenance tech **MUST** enter a time to complete estimate into the Estimated Duration field.
- Maintenance tech or PMT **MUST** enter a work type into the Work Type field. (Most repair work orders will be Type PCM {Planned corrective maintenance})

WI-03 Maximo sets the work request to WAPPR

- This is an automatic function in Maximo.
- WAPPR=Waiting to be approved.

Job Descriptions from RASI not HR

Job Description: Maintenance Planner

Primary Responsibilities:

- Responsible for initial screening of incoming work orders, identification of scope, and analysis of required level of planning
- Conducts field walk downs to identify and analyze corrective and preventive maintenance, modification and inspection activities and to provide input for refining and improving work package quality
- Identifies specific safety hazards that will be encountered in the performance of the proposed work
- Makes safety procedures, including lock-out/tag-out procedures available to employees. Ensures that all aspects of the existing company safety policy are incorporated into the job plan.
- Estimates and required hours on work order tasks and total work order duration
- Plans jobs with appropriate level of detail for the given skilled trades workforce
- Determines and includes QA/QC requirements on jobs.
- Procures equipment and specialized tool and equipment lists to perform work
- Gathers necessary engineering or technical documents, specifications and drawings
- Determines necessary skill level of craftsmen necessary to complete jobs.
- Writes clear and concise work procedures
- Determines and arranges for parts needed(when no expediter exists)
- Plans and kits parts for all projects to increase “wrench time” and maximize efficiency. (when no expediter exists)
- Compiles information into a Job Package that is ready for skilled trades – clearly communicates with skilled trades regarding critical steps in the process
- Upon completion of jobs, communicates with skilled trades regarding ideas and procedures that would make future jobs more efficient
- Coordinates priority setting with the management team – places specific emphasis on obtaining the input of operations personnel in the setting of priorities
- Keeps Bills of Materials current.
- Helps operations and maintenance prioritize backlogged work.
- Is able to accurately measure the maintenance backlog in its various forms and continually maintains not less than 2 weeks worth of ready backlog at all times.
- Responsible for equipment and repair parts data entry and management.

- Participates in the scheduling process, attends scheduling meetings in order to communicate backlog and priorities, and compiles the information into the weekly skilled trades work schedule.
- Oversees the scheduling of proactive work to include predictive and preventative work. Notifies the management team of the shortcomings in execution of these tasks. Measures and reports PdM and PM completion percentages on a regular schedule.
- Maintains equipment information and repair files.
- Ensures all work orders and maintenance log items are closed when work is finished.
- Participates in outage planning activities such as scope identification and control, scheduling, coordination, risk assessment, execution, and continuous improvement.
- Communicates with contractor resources directly on specific work orders assigned to the contractors and the performance expectations of the work order. Does not manage the contractors, but ensures that all of the details of the work order are clearly communicated and understood.
- Participates with Reliability personnel and improvement teams on improvement projects, particularly when they are related to improvements to the proactive maintenance plan (PdM and PM)

Skills and Knowledge Required:

- Computer skills required:
 - EAM/CMMS
 - Excel and Word
 - MS Project (desirable but not required)
 - Email
- Able to efficiently perform internet searches and research
- Able to read and interpret vendor manuals and drawings
- Able to communicate clearly and effectively with shop floor personnel, vendors, OEM suppliers, and management personnel
- Able to perform some level of cost analysis and work within a structured budget
- Ability to write detailed repair reports
- Able to develop and deliver a clear and concise presentation when required

Education and/or Certification Requirements:

- High School Diploma or Equivalent
- Experience with current EAM/CMMS desirable but not required
- Minimum 5-years work experience in the skilled trades
- Strong mechanical/electrical aptitude
- Some level of Supervisory experience is desirable
- Consideration will be given to individuals with an equivalent combination of education and experience.
- Committed to safety and teamwork.
- Highly motivated
- Ability to learn and apply maintenance best practices.

How to Roll Out Roles

- Processes RASI Step Text
- RASI Sorted by Job Title
- Overview, Then Train to Title not to Process
- Standards of Expectations
- Job Aids or Note Cards with Checklist of Commonly Forgotten

CMMS Expectations

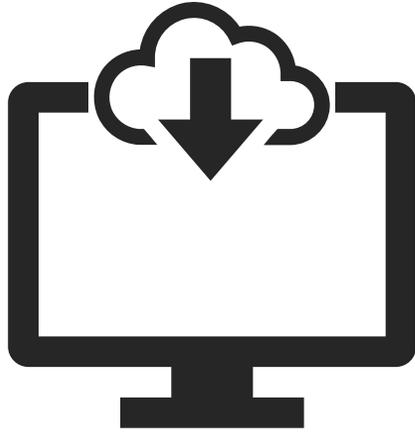


- What do the business processes and step text require?
- Is there more?
- How much text and detail?
- What fields and codes should be used and when?



Make index card check list for tactile reminder by role of expectations

Job Plan Library Expectations

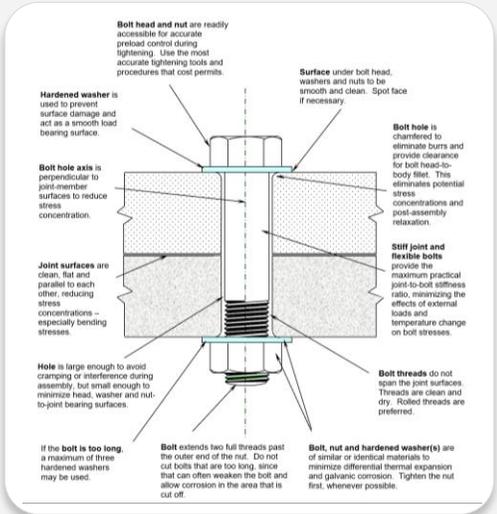
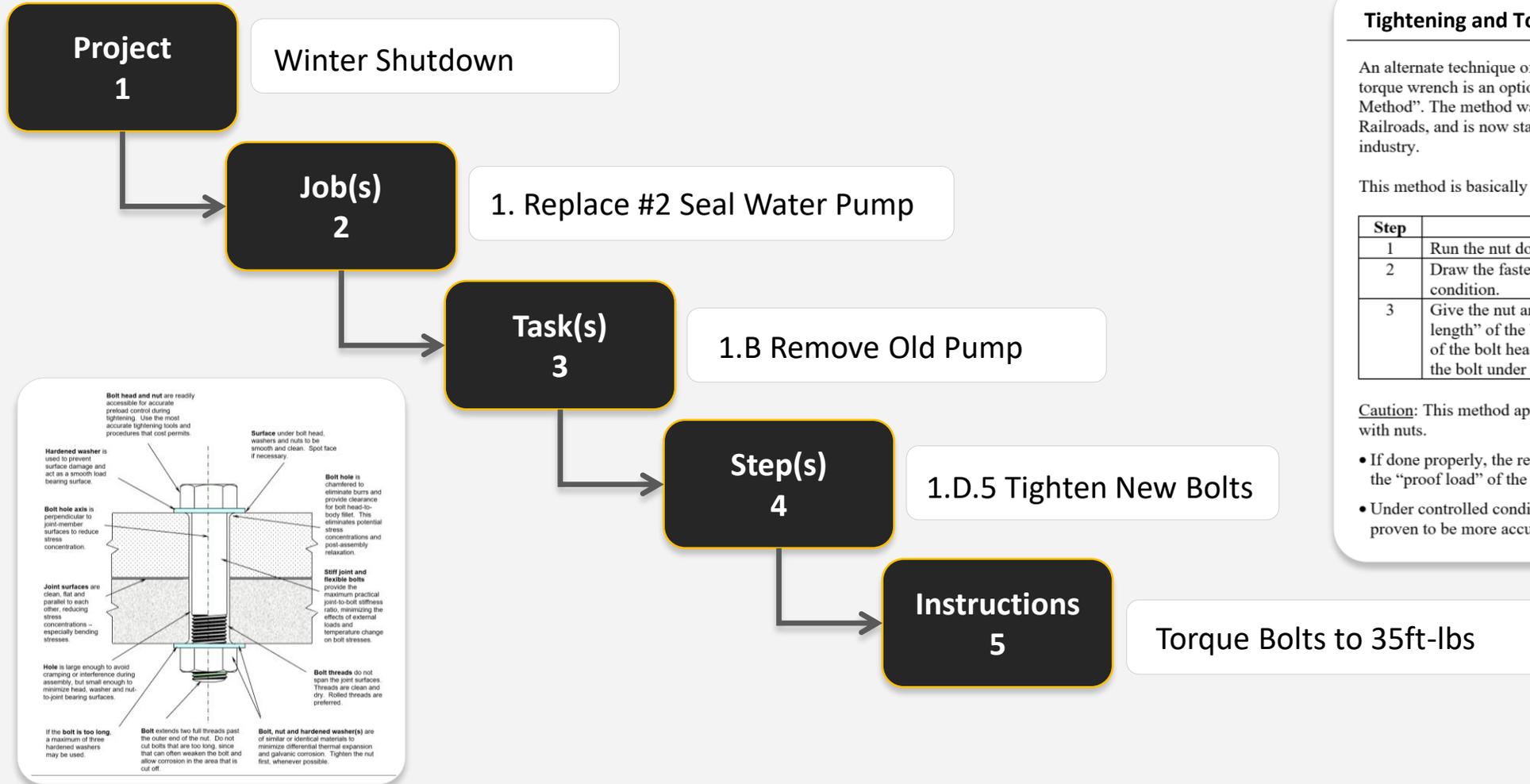


- Where Will They Be Stored?
- In the CMMS or eAM?
- On a Server?
- Will it Mirror the Hierarchy?
- Is it by Asset Type or Class?
- How Many New Plans Per Week?



Document Expectations and Train on the Answers

Job Plan Expectations with Precision Maintenance Standards



Tightening and Torque, continued

An alternate technique of manually applying preload tension without using a torque wrench is an option in some cases. It is known as the “Turn of the Nut Method”. The method was first developed by the American Association of Railroads, and is now standard procedure in the building construction industry.

This method is basically a three-step process:

Step	Action
1	Run the nut down by hand until it contacts the bearing surface.
2	Draw the fastener and the mating surfaces into a “snug” fit condition.
3	Give the nut an additional 1/3 – 2/3 turn depending on the “grip length” of the bolt. (“Grip length” is the distance between the base of the bolt head and the contact point of the nut, i.e., the portion of the bolt under tension after tightening.)

Caution: This method applies only with *coarse thread fasteners* tightened with nuts.

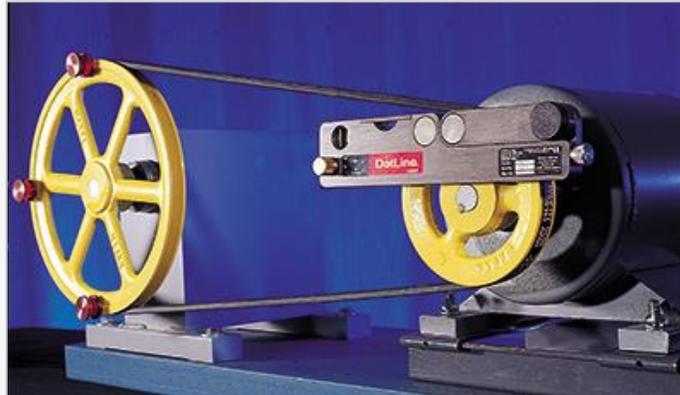
- If done properly, the resulting tension then will be approximately 75% of the “proof load” of the bolt.
- Under controlled conditions with experienced crafts people, this method has proven to be more accurate than using a torque wrench.

Standard Job Plan Format with Expectations

10	Verifying Guide Wear Limits				
10.1	LOTO Equipment BT 800635	MECH	1	.3	.3
	Warning: You MUST turn off and lock out/ tag out the appropriate PDP or power disconnect point BEFORE continuing. Make sure all forms of energy are isolated.				
10.2	Remove Guide wheel cover from unit.	MECH	1	.3	.3
10.3	Remove guide wheel with #5 allen head for inspection.	MECH	1	.3	.3
	Warning: Eye protection required to prevent injury.				
10.4	Thoroughly clean the guide wheel with parts clean and a rag.	MECH	1	.4	.4
10.5	Verify the diameter of the guide wheel with a micrometer. Ex. 1a below	MECH	1	.4	.4
	 Ex.1a				
10.6	Rotate the wheel 90 degrees and PERFORM a second measurement.	MECH	1	.4	
	NOTE: OEM specs are 1.500 inch. If any of the two measured specs are below OEM specs Replace as needed.				

- A Allen**
Excellent use of a "Warning" statement!
- A Allen**
Great step, I recommend that the job plan actually states which cleaner to use. Some cleaners may attack or breakdown the material the wheel is made of. This would be listed under consumables.
- A Allen**
Don't forget the craft hours for each step!
- A Allen**
This should actually be a "Performance Standard". It's great that you included this, the technician doesn't have to wonder about what is acceptable. This type of information really improves the quality of your job plan.

Include all Precision Tools and Expectations



Bill of Material Expectations

#1 Cartoner

Assembly Name : Box Former

Asset Number : GP67345

BOM Revision : 0

Approval Date : 25-Jul-12

Part Count : 2

Total Cost : \$4,450.00



Part #	SKU #	Type	Part Name	Description	Vendor	Qty	Units	Picture	Unit Cost	Cost
12345	GPA12345	Vendor Managed	Motor	Motor, AC, 1hp, 1800rpm, 3-Phase, 50 Hertz, Horizontally Mounted	GPA-Electric Warehouse	1	Each		\$ 4,000.00	\$ 4,000.00
G-10798	ACME12367	Stock	Actuator	Actuator, Pneumatic, 20-120psi, 8in Stroke, Unfiltered	ACME Pneumatics	1	Kit		\$ 450.00	\$ 450.00

Kitting Expectations

- What's in a Kit?
- What can't be Stored in the Kit? (size or hazard)
- When is a Kit Expected?
- Where is the Kit Expected?
- When is it Not Kitted? (one item)
- Are Kits Secure?



The 10 Test



How Many Can You Check?

- Work Execution Business Processes
- RASI or RACI
- Step Text
- Planner and Scheduler Job Descriptions built from RASI
- CMMS or eAM Usage Expectations for all effected
- Job Plan Library Expectations
- Job Plan Expectations with Precision Maintenance Standards
- Scheduling Template
- Bill of Material Expectations
- Kitting Expectations

POLL QUESTION No. 2



How many of the boxes on the previous slide can you check?
(Click only one answer)

- 1 or 2
- 3 or 4
- 5 or 6
- 7 or 8
- 9 or all 10

How Do You Support?

- Do You Have A Plan?
- Do You Have Reliability and or Maintenance Engineers?
- Do You Have a CMMS or eAM Admin That Works With The Planner?
- Do You Have A Natural Team? (Ops Liaison, Maintenance Supervisor, Planner and Scheduler)

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QUESTIONS?



Thank you!

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Next Best Practice Webinar: Tips, Technology, and Tools for Next-Generation Machinery Alignment

Wednesday, May 6, 11 a.m. ET

An aging workforce means younger people and newer tools tackling alignment issues in our modern rotating machines. With today's adaptive alignment tools and technology, and some basic fundamentals, even the most complex alignment jobs can be handled by anyone in the plant. There's no need to rely on just a few experienced mechanics to perform high-precision work.

Veteran machinist/millwright David Metz from PRUFTECHNIK shares his expertise on best practices for using next-gen solutions to address misalignment, soft foot, and more.

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