

Practical Reliability for the Pulp and Paper Industry



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INTRODUCTIONS



Bob Latino

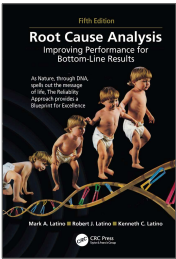
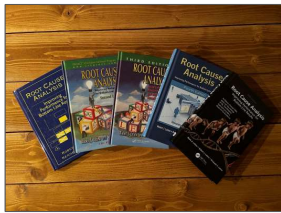


Ken Latino



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What makes a paper mill unique from a Reliability perspective?



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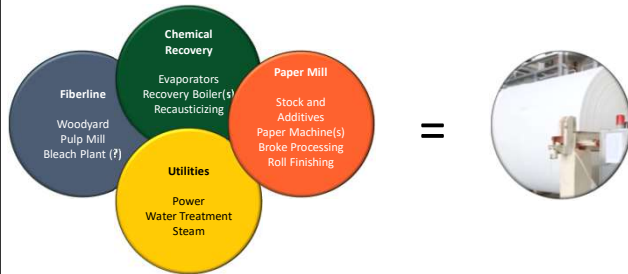
They are a combination of interconnected continuous processes and discrete manufacturing system



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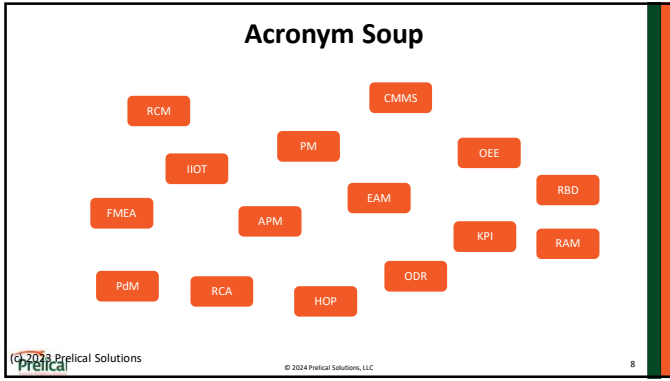


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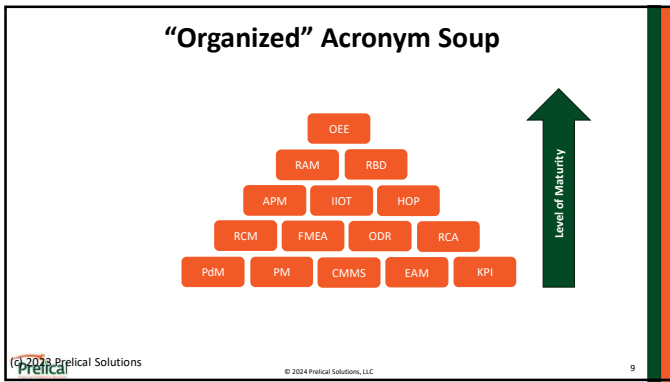
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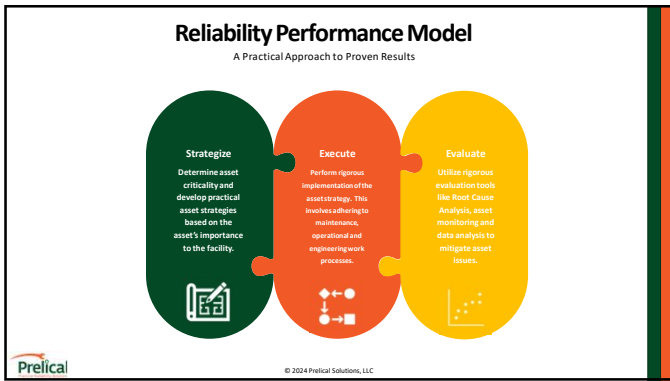
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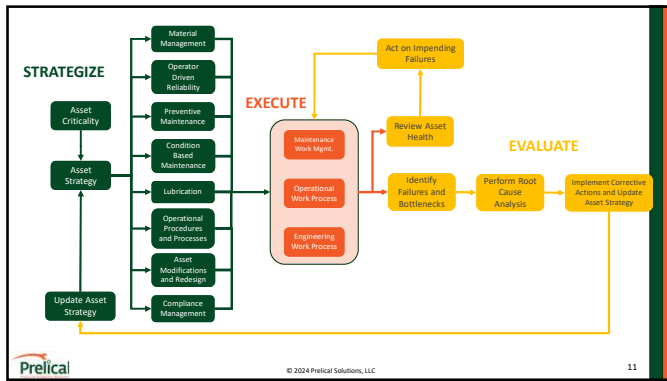
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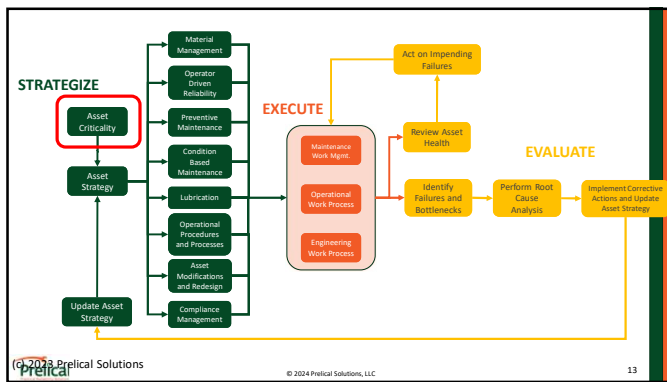
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Risk Variables

- Safety
- Environmental
- Operations
- Financial

		Consequence				
		Very Low 1	Low 10	Medium 100	High 500	Very High 1000
Probability	Frequent 5	5	50	500	2500	5000
	Probable 1	1	10	100	500	1000
	Possible 0.3	0.3	3	30	150	300
	Remote 0.1	0.1	1	10	50	100
	Improbable 0.05	0.05	0.5	5	25	50

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Overall Rating

Safety
1 x 10 = 10

+

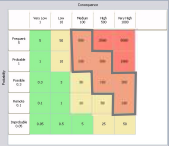
Environmental
1 x 100 = 100

+

Operational
1 x 100 = 10

= 120 (B)

Rating	Range
A	>= 1000
B	>=100 and <1000
C	>5 and <100
D	<=5



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Why is Criticality Important?



Determines what level of asset strategy is required to mitigate failures



Helps to determine stocking levels of materials in the storeroom

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Asset Criticality Distribution

High Criticality (A)

- 5-10% of Assets
- Consider robust asset strategies development

Medium Criticality (B)

- 20-30% of Assets
- Manufacturer Recommendations
- Asset Specific Templates

Low Criticality (C/D)

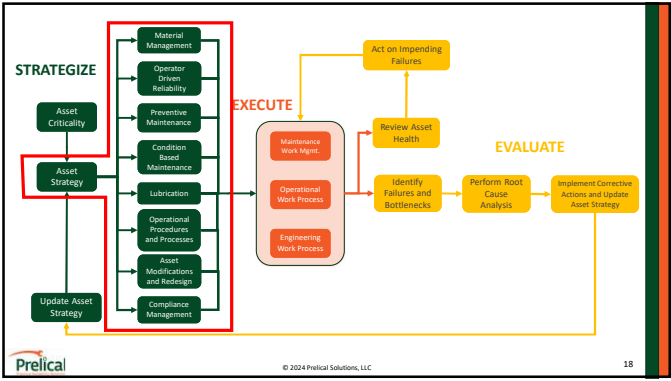
- 60-75% of Assets
- Basic Care
- Run to Failure

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Failure Phases

Phase of Failure	Effect	Mitigating Action
Primary Failure	Initial indication of an impending failure	Condition Monitoring
Secondary Failure	Inability to perform intended function	Root Cause Analysis (RCA)

Primary

Process temperature too hot →

High vibration of bearing →

Pipe thinning →

Secondary

Off-spec product

Pump fails

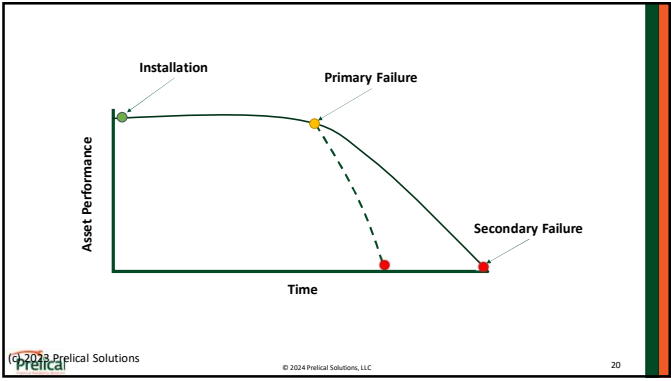
Steam leak

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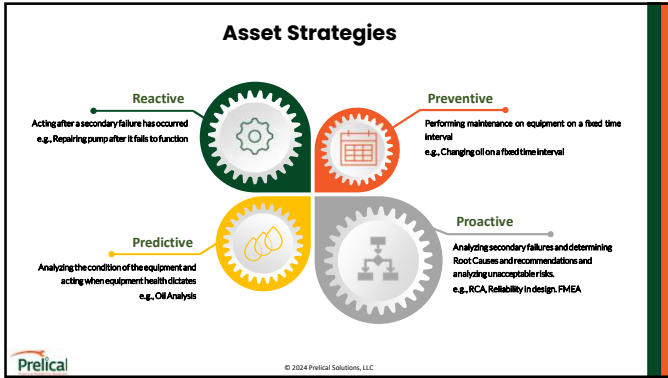
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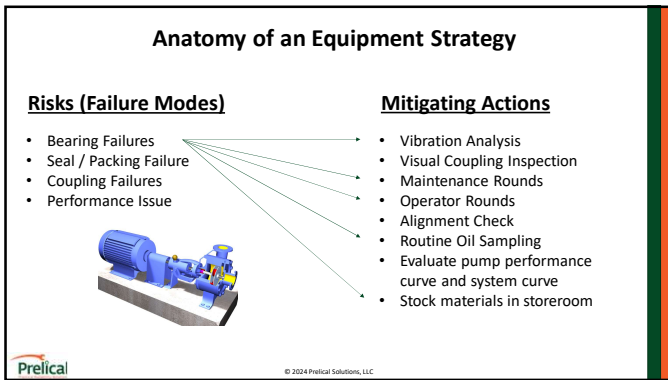
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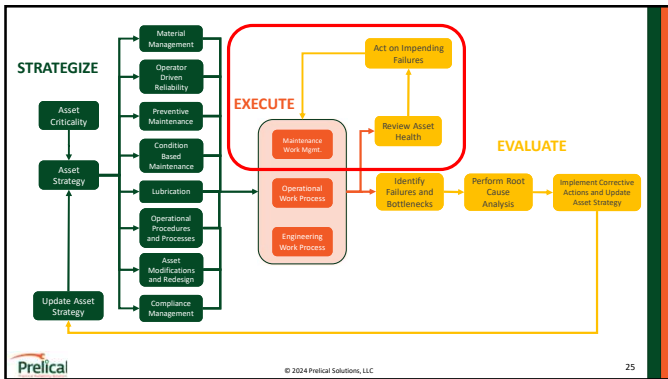
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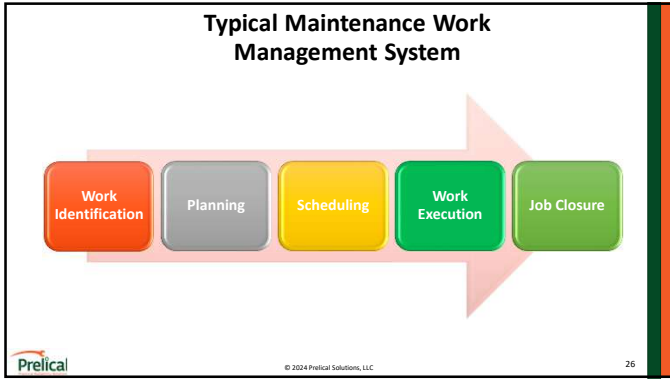
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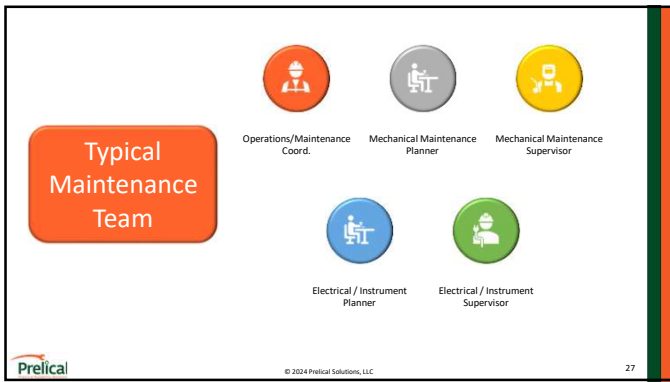
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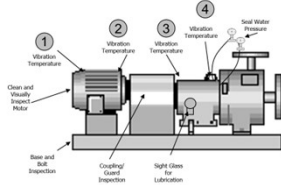
Rounds (Operator/Maintenance)

- Early detection of equipment defects
- Use of operator/craftsman senses and basic diagnostic tools
- Supplements more advance inspections performed by Predictive Maintenance Group (e.g. vibration, infrared)
- Allows identified defects to be planned and scheduled
 - Will reduce unplanned equipment downtime and related maintenance repair cost
 - Reduces the probability of safety and environmental issues
- Creates a feeling of ownership of the equipment



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Pump / Motor Data Collection Points



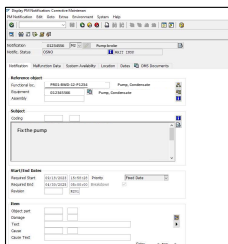
Centrifugal Pump

- Check Bearing Temperatures (inboard/outboard)
- Check Bearing Overall Vibration (ips) (inboard/outboard)
- Check Seal Water Pressure
- Inspect Coupling RPM (if safe to do so)
- Inspect for loose, short or missing bolts on base and flanges
- Check oil level
- Check oil quality (visual inspection)

Electric Motor

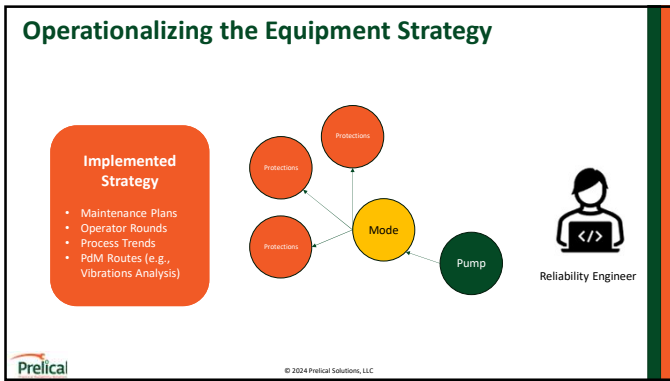
- Check Bearing Temperatures (inboard/outboard)
- Check Bearing Overall Vibration (ips) (inboard/outboard)
- Ensure airflow on fins and back, and clean debris from back of motor
- Inspect for loose, short or missing bolts on base
- Ensure all cables are in working order

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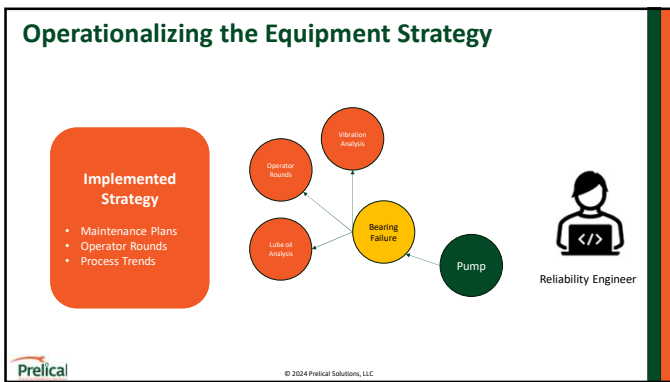


Quality work
history starts
with accurate
SAP notifications

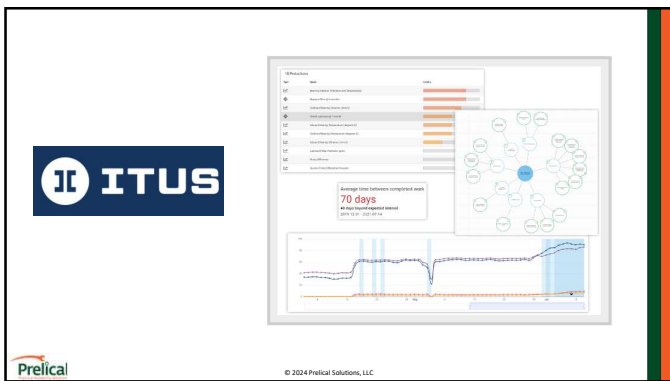
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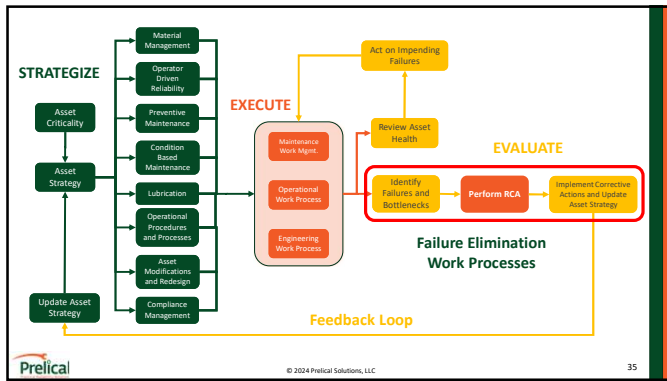
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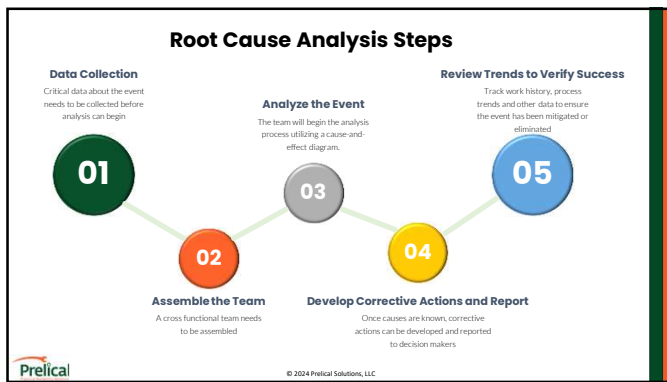
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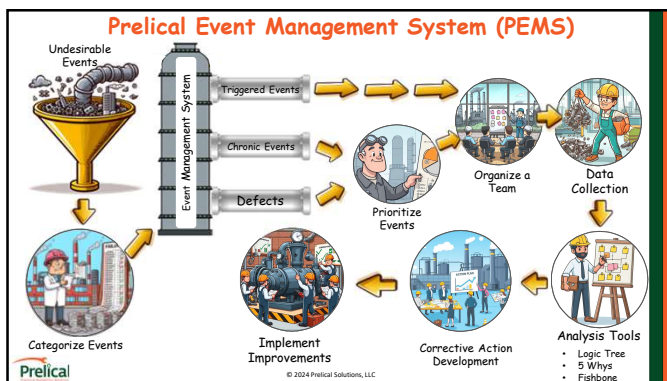
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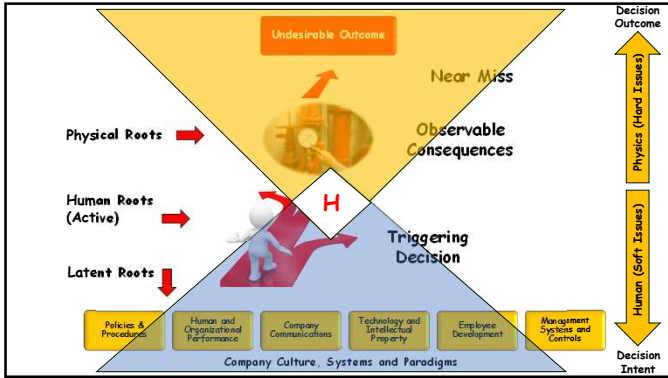
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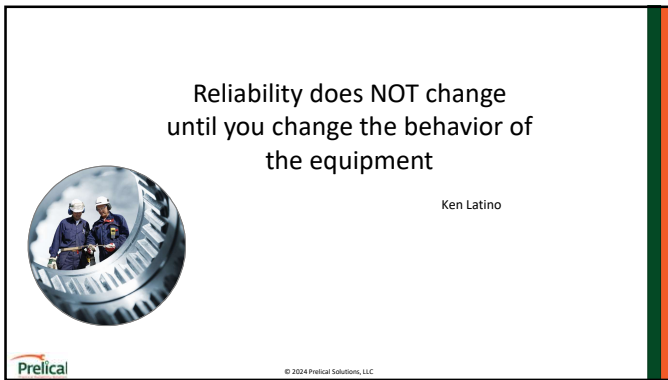
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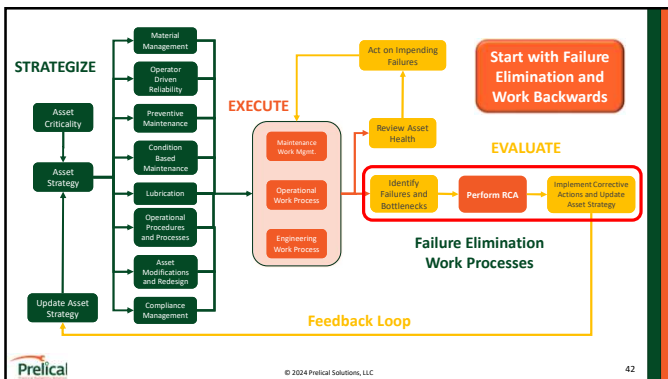
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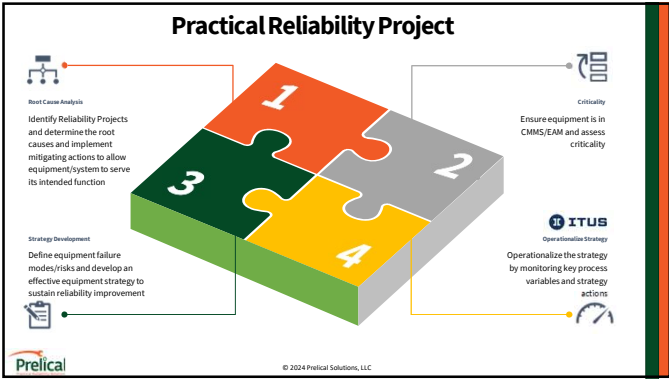
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Reliability Project Examples

- Thick Stock Pump Failures
- Pulper Plugging
- Broke Processing Issues
- Fan Pump Failures
- Paper Machine Sheet Quality Issues
- Startup Delays after a Machine Outage
- Recovery/Power Boiler Trips
- Soot Blower Failures
- MC Pump Failures
- Refiner Failures
- Machine Roll Bearing Failures

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Role of Reliability Engineer

Positive Roles (Green Checkmark):

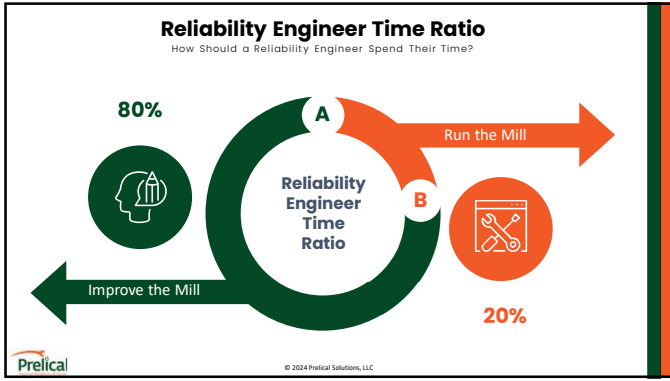
- ✓ Developing Reliability Project Lists and Performing Root Cause Analysis
- ✓ Determining Equipment Criticality and Developing Equipment Strategies
- ✓ Implementing/Operationalizing Equipment Strategies

Negative Roles (Red X):

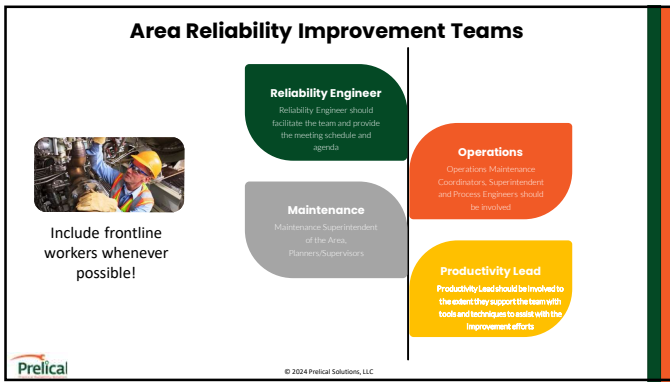
- ✗ Troubleshooting the "Failure of the Day"
- ✗ Extra technical person to work outages
- ✗ Part Time Planner, Database Administrator, Supervisor, Etc...

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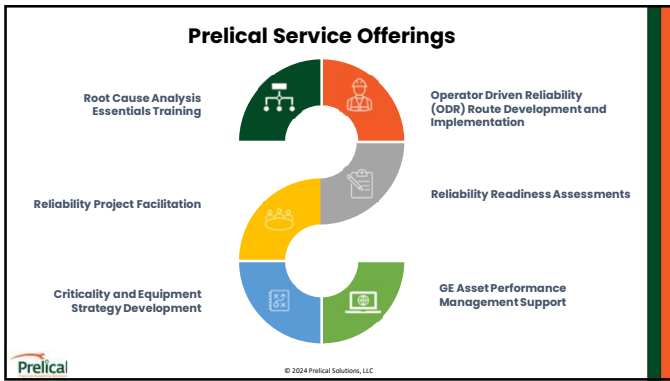
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Root Cause Analysis Essentials Workshop

Atlanta, GA
May 8-9, 2024
Oct 1-2, 2024



<https://go2learn.regfox.com/rca-essentials-workshop>



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Thank you for attending!

Please refer to the link below to download the slides from today's webinar.

<https://content.prelical.com/downloads>



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