

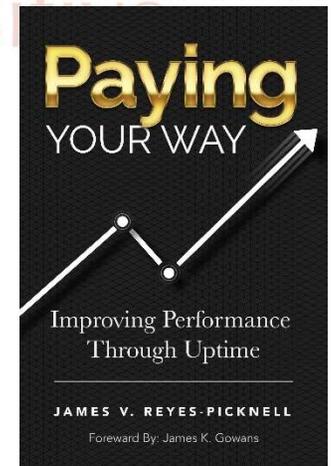
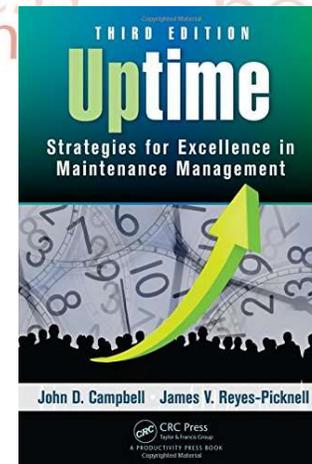
# Excellence in Maintenance Management

## An introductory series of webinars

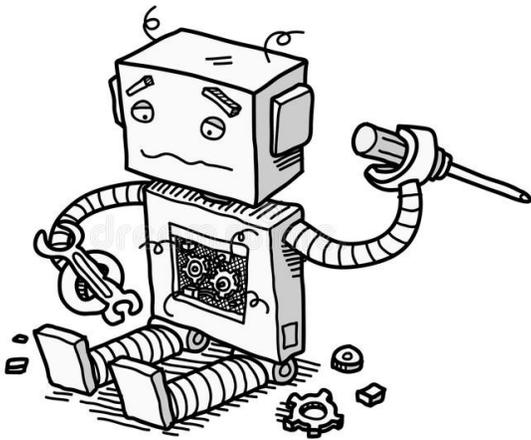
### 1 - Strategy

educate inspire empower coach

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# Why Maintenance?



- Benjamin Franklin, “An ounce of prevention is worth a pound of cure”
  - Originally about health
  - Also works for machines

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# Maintenance response to business needs

## Business Needs

- Maximum production
- Low costs for tight times
- Reduce CAPEX
- Extend plant life
- Increased production

## How maintenance supports

- Highly reliability and minimum downtime
- Use downtime for maintenance and reduce shifts
- Restoration to maximize asset life
- Maintain at minimum cost (no restorations)
- High reliability and minimum downtime

# Maintenance costs

- Proactive maintenance is more effective (equipment lasts longer) and efficient (lower costs to achieve it)
- Need a balance of preventive, predictive and detective methods
- Need good planning and scheduling

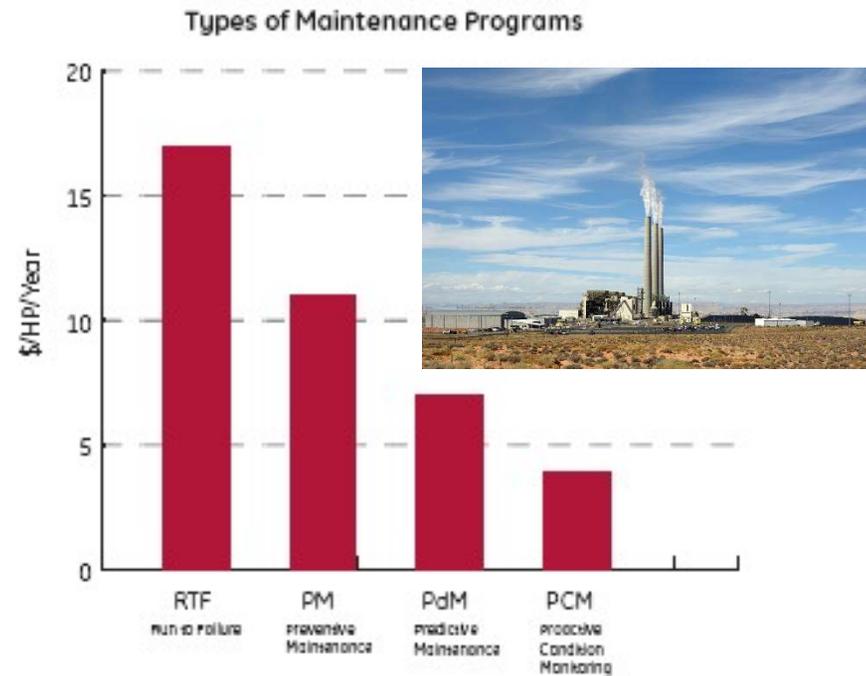


Figure 4 – Cost of maintenance versus maintenance practices employed, as summarized by an Electric Power Research Institute (EPRI) study.

# Risks

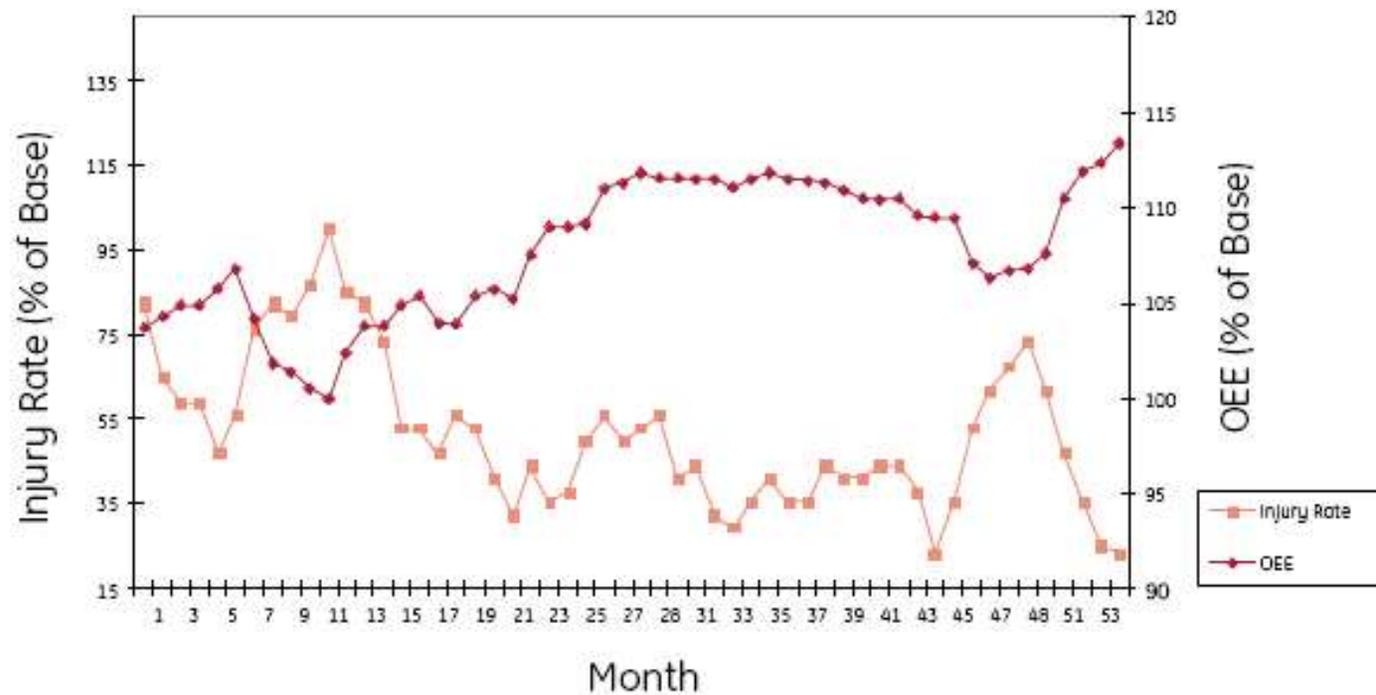
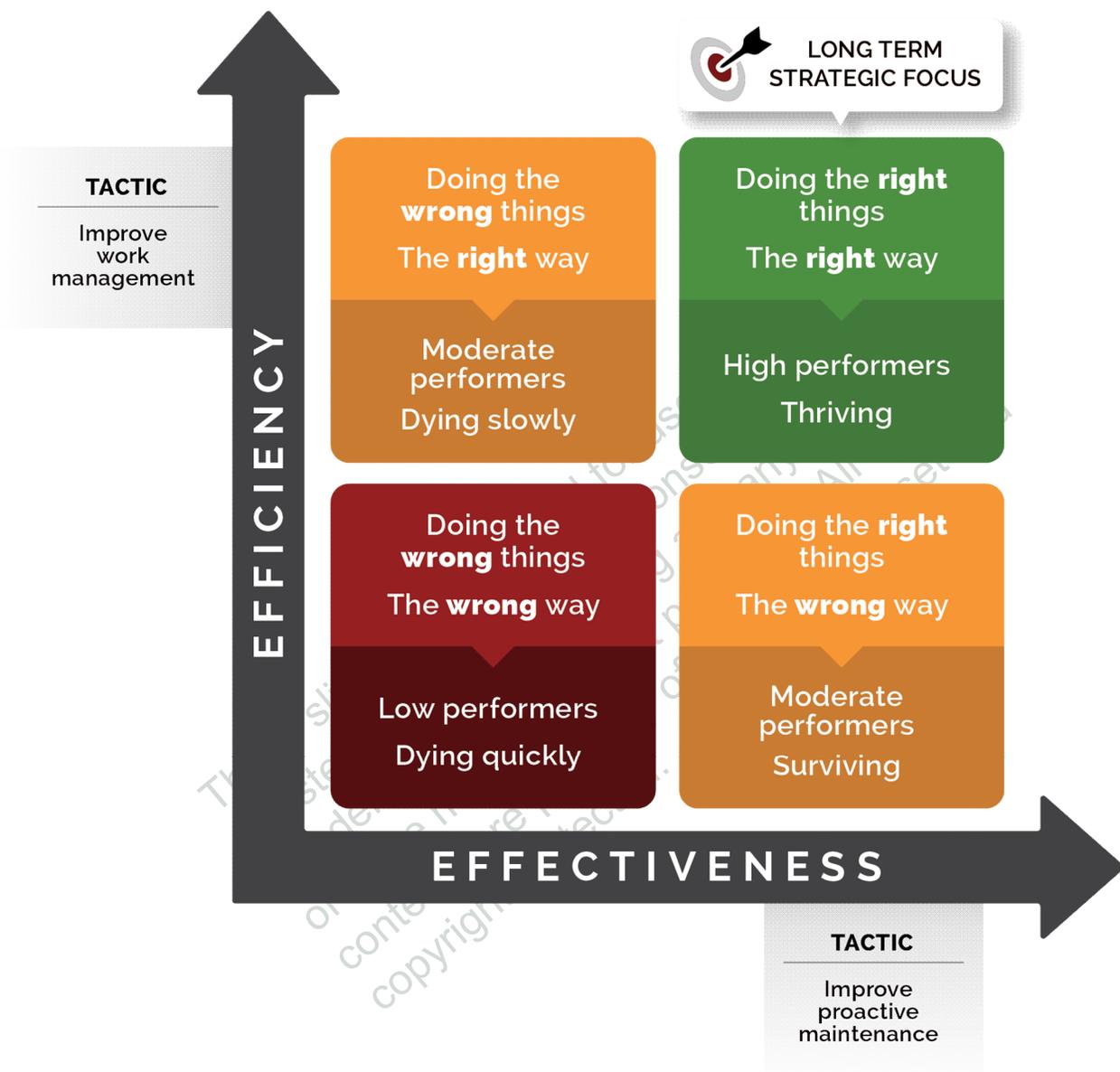


Figure 5 – Injury Rate and Overall Equipment Effectiveness (OEE).

*In addition to costs, safety risks, environmental risks, downtime risks all go down as Reliability goes up*

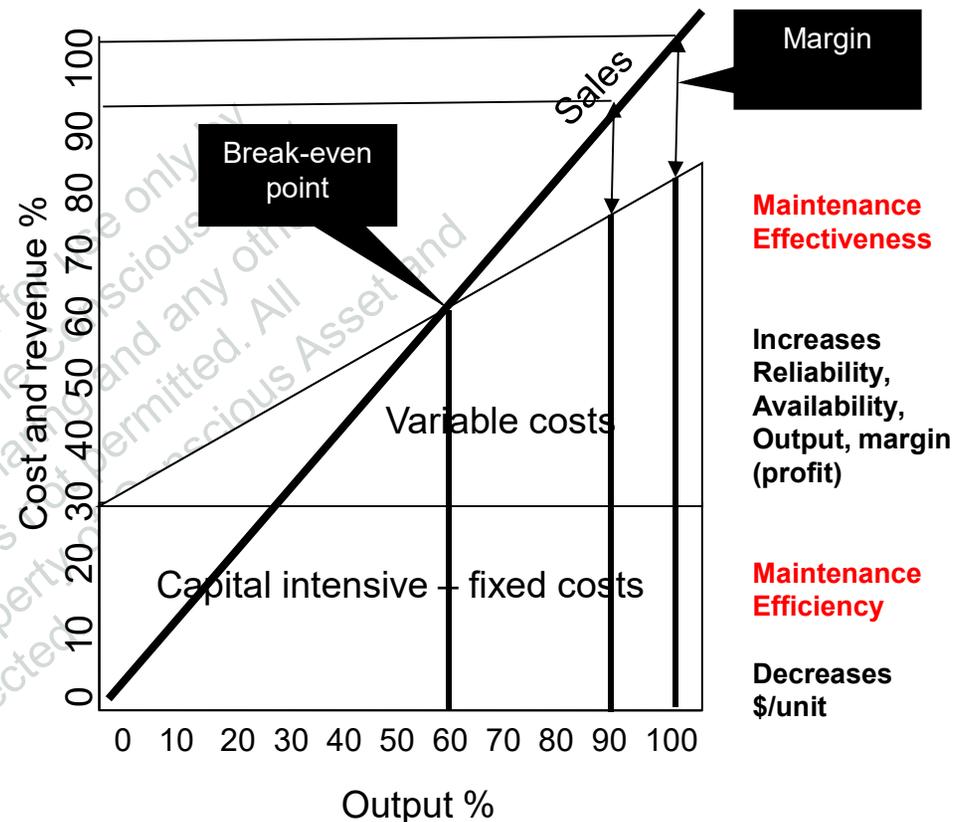


# Uptime Model of Excellence



# Maintenance sustains capacity

- Fewer failures
  - Increases the time between failures
    - More uptime
    - MTBF ↑
    - Output ↑
    - Output more stable
  - Fewer repairs
    - Less downtime
    - Cost ↓
- Better repairs
  - When it's fixed, it's fixed!
  - MTTR ↓
  - Cost ↓



# Reliability and Maintenance

## Reliability WHAT

- The goal
  - Requires proactive maintenance investment
  - Less expensive to achieve than running to failure
- Requires good maintenance program design
- Operations and engineering
- Requires “essentials” to be working well

Hallmark of a wise and mature maintenance organization

## Maintenance HOW

- Activity and a department
- The means
  - Can be reactive or proactive or a mix of those
  - Seen as an expense
- With no thought, maintenance will become reactive and high cost
  - Often happens if production is “in charge” of maintenance

Maintenance is party to high reliability, but cannot deliver it on its own

# Your role as a leader

- You provide
  - Strategic direction
    - Cascade from corporate objectives
    - Active sponsorship of improvement
- You must
  - Delegate, don't abdicate
    - Give authority to those with responsibility
    - Hold people accountable to deliver action and results
  - Demonstrate that you really care
    - Be visible and engaged
    - Command and nurture (not command and control)
  - Encourage the right actions
    - Cooperation and information sharing are important
    - Challenge silo thinking and behavior
  - Attack problems not people
    - Encourage problem solving by those who should be doing it
  - Use the proactive language of improvement
    - What have we learned from this failure?
    - What can we do to prevent this in future?

# Do you really have the authority you need?

Chances are, that if you are taking this course, you either work in or manage maintenance, and/or reliability. If so, your span of control is limited to your own department, and you probably don't have the final say on spending to make all the improvements you will need to make.

If you report to an operations / production manager you too will need help from higher than your boss. You will need to get your plant or general manager, VP Ops, COO or CFO onboard as a sponsor and active supporter. Without that your best efforts will meet with only limited success.

Our latest book, "Paying Your Way," is written for the general manager level and above. Consider encouraging your GM, VP Ops or other leader who has P&L responsibility to obtain a copy and read it.

What we do to reach high levels of performance isn't all that complex, but the way we get it done dramatically increases both the probability it will work and the level of achievement you can expect.

# You're a new maintenance/reliability manager

- As the new “broom”, you have a mandate to sweep cleanly
- For about 6 months, new in the role, you will be expected to make decisive changes
- DON'T:
  - Take long to sort out the lay of the land, analyze what's going on (or not) and generally delay or dither – those would all be career limiting moves – you were hired/promoted because you are supposed to know what to do
  - Continue with things as they were if they weren't already at a level of high performance – your boss should expect more from you
- DO:
  - Take advantage of your new status and get moving on rocking the boat – be a leader, not just a manager

# If you have been in the role for a while

In my consulting career and even before it, I've seen many attempts to cover up under-performance, make excuses and generally do nothing to improve. Often times it has been a manager who's been there a long time who is at the center of that effort to "put lipstick on the pig". That effort is often ego-driven – he/she doesn't want to look bad to the boss.

As an outsider, like a new manager who could replace you one day, it is fairly easy to spot the signs of that behavior. Ultimately it only makes the individual look bad.

- If you have been in the role of manager for a while and you have not dealt successfully with the problems that Uptime will help you deal with, then you need to learn and act decisively. It may mean giving up a bit of ego boosting behavior. That requires an admission to yourself and probably no one else, that you needed to learn. That's not a weakness. Chances are that no one else really knows how to fix it either, even if you start a whole new direction after a long time, you still have an opportunity to be a hero to your organization.
- DO NOT
  - Try to hide that you are learning too – it's far better to admit it and change
  - Pooh-pooh what this course is teaching – it's been proven in action for over a quarter of a century in many companies and industries – yours is not as unique as you might think
- DO – learn (this course is a good start), read "Uptime" and ask for help with the transformation project you need to lead
  - We have been through these changes with customers before and we know what does and doesn't work. Take advantage of that experience.



# Why use Uptime?

## Integrated model

- 10 inter-dependent elements work together for best results
  - Holistic approach (people, technology, process and sustainability)
  - Based on experience of what works well and what doesn't
  - Easy to implement if you don't rush it and if you stay with it

## Not prescriptive

- Flexible starting point
  - Each site is different and unique
- Adaptable to your circumstances
  - There are usually some quick wins
- Provides consistent direction

## It works!

- Model has evolved with 20 years of experience and adaptation
  - Book: 1995 – 2006 – 2015
- Used world-wide and emulated by others
  - Alternatives models available: some more detailed, some more prescriptive, some omit parts
  - One model even copies the name!

## How do you start?

- Assessment vs. Training

# Where are you today?

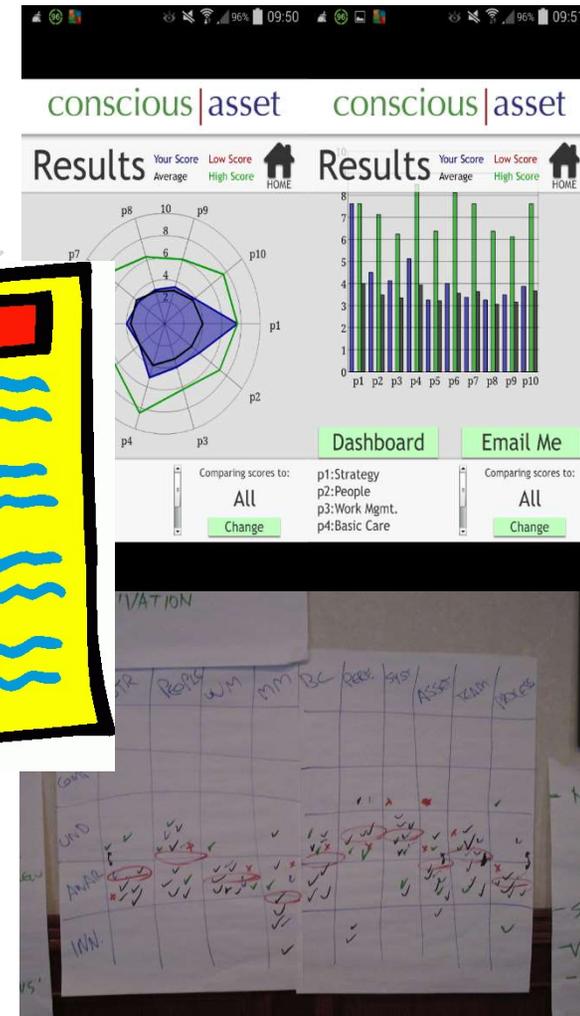
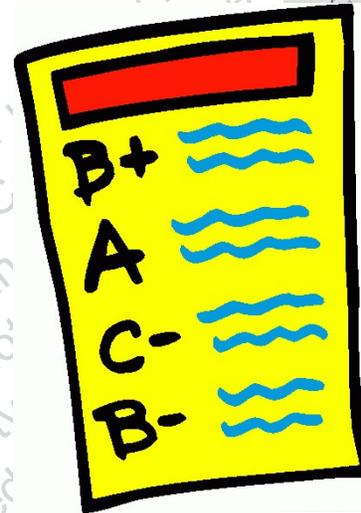
Uptime - Strategies for Excellence in Maintenance Management (3rd Edition)

Maturity Profile	Strategy	People & Teams	Work Management	Materials Mangement	Basic Care	Performance Management	Support Systems	Reliability Centered Maintenance	Reliability Quick Start & Optimization	EBAM
<p><b>Rare</b> →</p> <p>Excellence</p>	Maintenance programs clearly support broader corporate strategic goals. Programs and practices well established, documented and undergo continuous improvement.	Fully developed multi-skilling, autonomous teams of operators and maintainers active. Specialist engineering support available.	Long term planning cycles and extensive use of standard job plans. Planning is used to determine all support requirements for new systems based on RCM results.	Stockouts rare. Service level 98% plus. Inventory turns > 2 times.	Full regulatory compliance. PM program features extensive CBM. Operators do some minor PM. Equipment condition good. 5S fully implemented and sustained.	Fully balanced score cards for teams. Improvement results evident in performance trends.	Full user acceptance and widespread use of integrated management systems sharing information across the enterprise. Information is widely used in EBAM and reliability work and performance management.	RCM being used proactively for new projects. RCM, maintenance planning and support analysis used before new equipment / systems are put into service.	Reliability enhancements rely on use of advanced mathematical models and data. RCM results are continually improved upon. RCFA used occasionally.	Data is useful. Any gaps are closed with a formal knowledge elicitation process to ensure information is reliable. Decisions are regularly informed with trustworthy evidence.
<p><b>W.C.</b> →</p> <p>Competence</p>	Maintenance strategy and plans align with corporate strategic goals. Improvements in place. Maintenance is "under control".	Multi-skilling and managed teams of maintainers and operators. Regular use of RCFA and RCM analysis teams.	Scheduling and planning well established for most work. Compliance high.	Inventory turns > 1. Service level 95% plus. Stockouts less than 5%.	Full regulatory compliance. PM program features some CBM. Operators help with PM. Equipment condition good. 5S fully implemented	Reliability measures in use and improvement programs monitored, trends being developed.	Extensive management systems in use with integration for sharing and re-use of important information. CBM and reliability analysis tools in place. EBAM in use.	PM program fully developed using RCM / PMO and improved using RCFA. RCM results evident in procedure changes, training, equipment mods.	RCFA used as complement to RCM program. Experimenting with more complex reliability tools / methods. PM Optimization no longer needed.	Data gathering is reliable and good information is available for improvement efforts. There are information gaps that are being filled by experienced workers.
<p><b>Most</b> →</p> <p>Understanding</p>	Management defined strategy & plans. Improvement efforts are underway and working.	Some multi-skilling. Mostly distributed maintenance teams with conventional supervision. Task based teams used as needed.	Scheduling established, compliance good. Planning for major work and shutdowns as work arises.	Inventory turns > 0.7. Service level 90% plus. Inventory analysis being performed.	Partial regulatory compliance. PM program based on fixed interval tasks with little CBM. Equipment condition fair. 1, 2 and 3 of 5 S implemented	Basic maintenance performance measures in use.	CMMS, EAM or ERP is in use with report generation and analysis. CBM is supported with specialized systems. Documentation, financial records, maintenance, stores, etc. not integrated.	RCM program in use for critical equipment. PM program blends manufacturers recommendations with experience and RCM results,	RCFA used for more than just critical failures. PM Optimization applied to "clean up" the existing PM program.	Data is being used in problem solving (RCFA) but data problems are evident. Decisions still require mostly experiential inputs.
<p>Awareness</p>	Documented goals but no objectives or plans to achieve them. Attempts at past improvement programs have failed.	Maintenance organized by shops. Some area maintainers assigned. Conventional supervision. Occasional teams used for RCFA.	Scheduling with about 50% compliance. Plans for shutdowns only	Inventory improvement plans in place. Measurement of stores performance started.	Poor regulatory compliance. PM program under development using traditional methods. Equipment condition fair. 5S training and pilots.	Financial measures used to analyze spend patterns. Some downtime records.	Management systems use is spotty and providing little valuable output. CMMS is in place and operating independent of other systems. A number of ad hoc systems are in use.	Downtime analysis is performed and some improvements are implemented. PM program is being followed.	RCFA used for highly critical / visible failures. It is the primary reliability tool.	Data collection is done but generally data is in poor shape / useless for reliability purposes.
<p>Innocence</p>	No documented strategy. Maintenance is largely reactive to breakdowns.	Centralized organization based on trades demarcation. No sign of teamwork. Operations and maintenance do not collaborate.	No planning, little scheduling and poor compliance to schedule	Frequent stockouts. Service level poor. Jobs frequently waiting for parts.	Poor regulatory compliance. Minimal or non-existent PM program. Equipment condition poor.	Only financial measures being watched but no analysis of costs performed.	Little to no use of management systems. May be using variety of ad hoc systems with little to no sharing of data and information among them. Maintenance is operating its own isolated information island.	Plenty of downtime but no analysis of causes or attempts to improve. PM program missing or not followed. Production complains about how badly maintenance manages its assets.	No effective reliability improvement efforts being made. Reliability poor and stays there. Production complains about how badly maintenance manages its assets.	No use of data / information as evidence in analysis of systems, problems, failures, etc.

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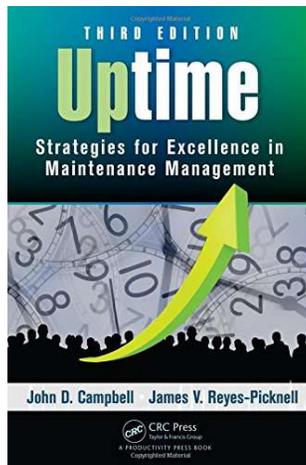
# Getting started – where are you?

- Assessments
  - Thorough and complete
  - Little doubt about what must be done
  - Can be expensive
  - Usually generate resistance
- Self-assessment
  - Easy to do (App) and inexpensive
  - Scores may not reflect successful practice
  - Recommendations are high level
  - You may still lack insight into what needs to be done and how to do it
- Training
  - Educate in successful practices
  - Generates improvement ideas internally
  - Includes an informed self-assessment
  - Knowledge of what, why and how increased
  - Lowers resistance to change

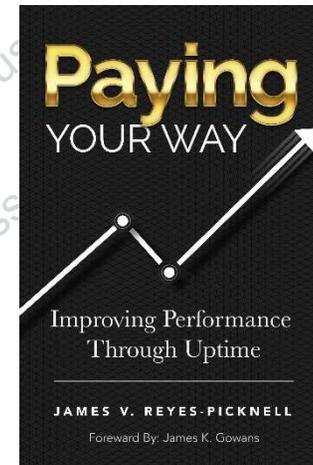


# More information

## The model



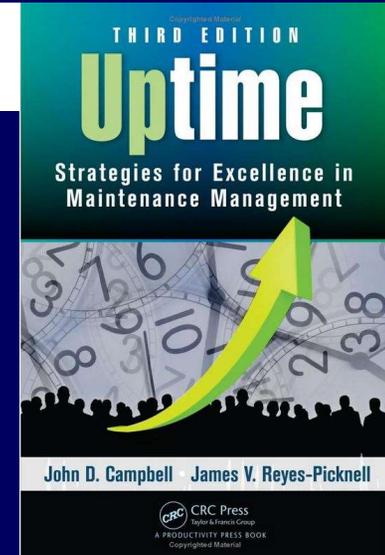
## The business



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# It's time to optimize

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