


# Tool-Box Talk – “How to know if your CMMS/EAM is effective, and options if it is not meeting expectations”



## CMMS – A HIDDEN TREASURE

- Investing in a CMMS is very similar to any other capital investment.
- One significant difference between the CMMS investment and other capital investments is that, over time, your return on investment for a CMMS will increase.
- This is because the CMMS system is doing something hardware doesn't. It is collecting information that can then be used to further improve the efficiency of your processes.
- Maintenance must be managed with a fully functional CMMS in order to

Reap the benefits expected

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# CMMS 101

By Ricky Smith CMRP



# What is a CMMS?

- **Computerized Maintenance Management System (CMMS)**, also known as computerized maintenance management information system, is a software package that maintains a computer database of asset reliability information used to manage any maintenance organization to become successful.
- CMMS allows Leadership to make the “Right Decisions at the Right Time” regarding asset reliability and maintainability.

# History of the CMMS?

- **First Generation: Punch cards.** The first CMMS systems were used to remind maintenance technicians to perform simple recurring tasks like changing the oil in equipment. Technicians would punch work-order data like failure codes into punch cards, which were fed into the computer via card readers.
- **Second Generation: Mainframe computers.** Fast-forward ten years, and not much had changed except a move from punch cards to paper forms. Every day, work orders were printed out on paper and distributed to the maintenance team manually. When the technicians completed the job, they filled out the work order forms and returned them to data-entry clerks, who then would type the information directly into the mainframe computer.
- (Alumax Mt Holly was the first plant in the world with a fully integrated CMMS available to technicians throughout the large facility (Capital Investment in 1975 for the first plant in the world to achieve World Class Maintenance status)
- **Third Generation: Mini-computer.** To this point, due to the huge investment in implementing and owning a CMMS, small and medium-sized businesses could not afford to implement a CMMS. In the 1980s, we saw the introduction of the mini-computer, making CMMS software more affordable to medium-sized businesses.
- **Fourth Generation: PCs and LAN.** With the emergence of the personal computer and advances in networking, the 1990s saw the creation of many homegrown Microsoft Access-based CMMS applications. These custom-built applications became the foundation for new CMMS software businesses.

# Issues You May Experience

1. We do not have the money to implement 100% (may need to implement in one area “POC” (Proof of Concept))
2. Do not see the value of full implementation (remember, it is all about the money, Maintenance cost as % of RAV)
3. Customer not educated in Maintenance Best Practices
4. Customer wants to fragment implementation (Explain future state based on known best practices, unsure of meeting expectation through experimentation)

# Why CMMS Use is Not Effective

## 1. No one understands the True Value of the CMMS ...

- Leading and Lagging Metrics are not used to manage the assets
- No Consistency in management of all assets
- Money is wasted everyday because of equipment failure, partial functional failures and total functional failures
- Implementation of the CMMS was fragmented because of cost
- Customer is the expert (CMMS Company must share knowledge with customer critical for first step)
- Customer wants to know the Value Proposition
  - Difference between current state and future state (Maintenance Cost as % of RAV Calculation)
  - Managing with accurate data (an organization cannot manage what they cannot measure effectively and efficiently)
  - The CMMS is not a Money Machine, it is an enabler of asset reliability and thus the controller of cost

TABLE 7.2. Maintenance Costs in Typical and World-Class Companies

Metric	Typical	World Class
Maintenance cost/replacement asset value		
Maintenance cost must include labor (including overtime), materials, contract maintenance, and capital replacements, and maintenance (replacing worn-out assets because they were never properly maintained)	3.5–9%	2.0–3.0%
Maintenance materials cost/replacement asset value		
Maintenance materials cost must include material in storeroom stock plus material in other locations (maintenance shop, plant floor, etc.)	1.0–3.5%	0.25–0.75%



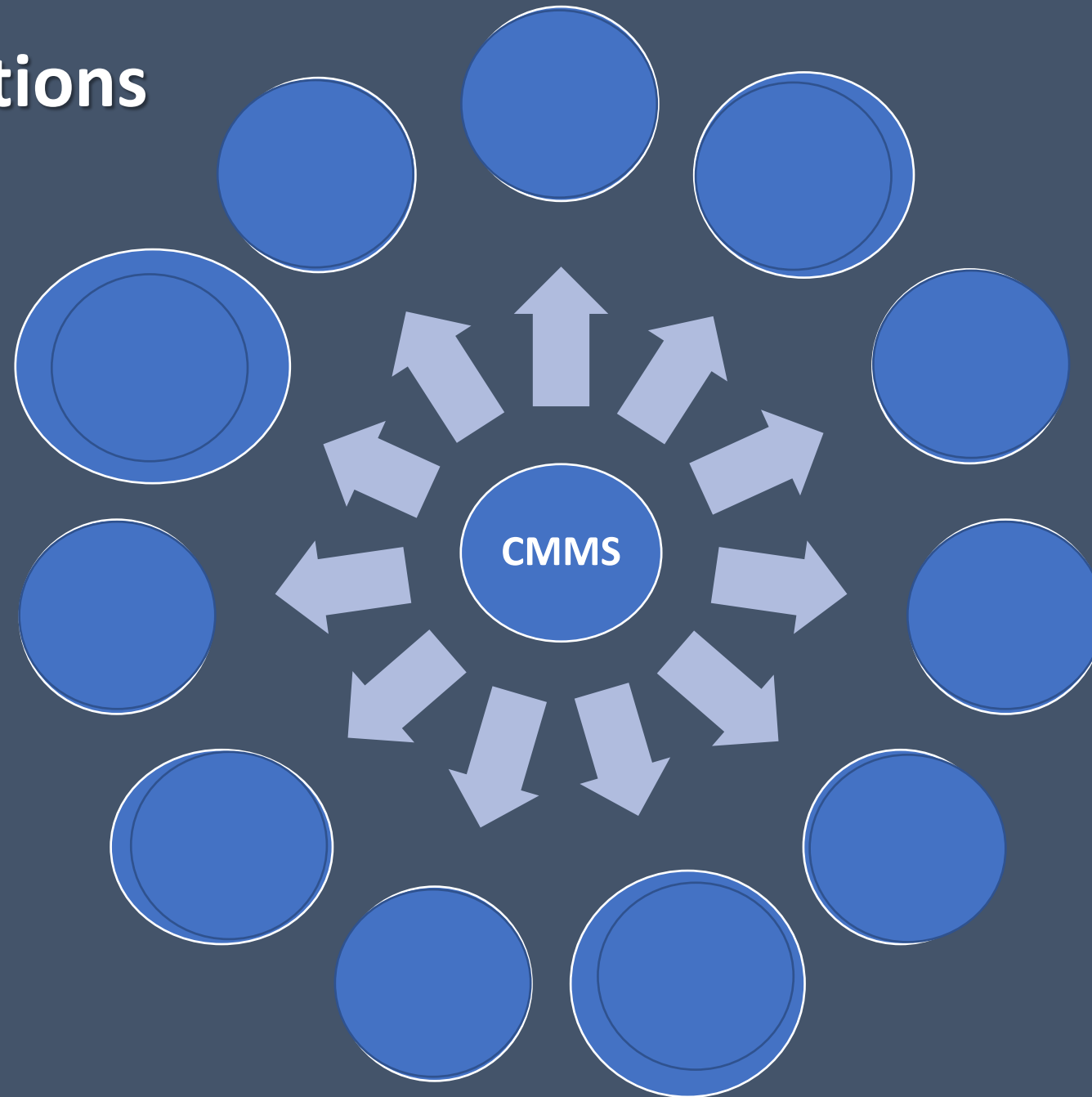
# Benefits of a CMMS

Managers understand the benefits that maintenance software systems offers through:

- Extended longevity of assets
- Reduced total cost
- Reduced equipment downtime
- Optimized inventory management (min/max/reorder point/safety stock)
- Provides data to optimize asset reliability and identify “bad actors”



# CMMS Functions

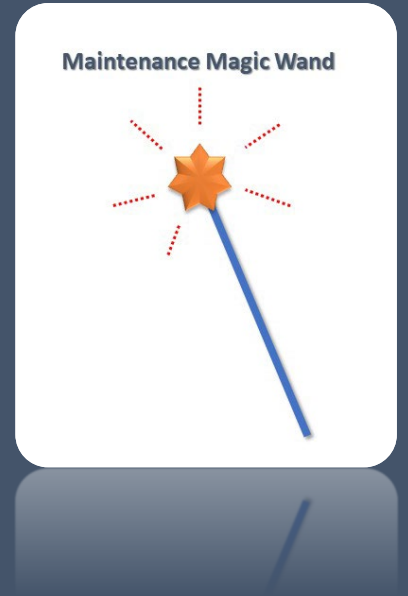




# If you had a Magic Wand, what would you expect from a “World Class CMMS”

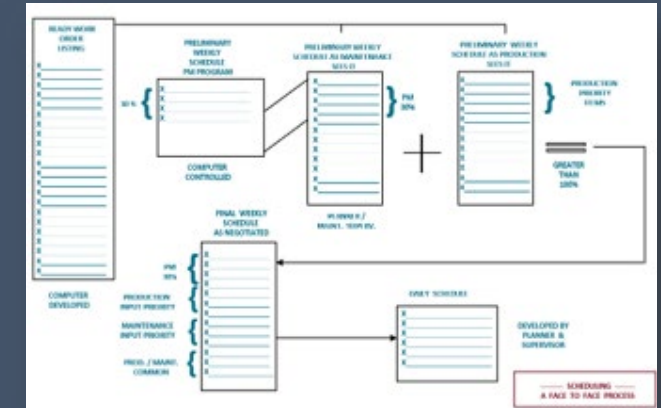
## Example:

- User Friendly? (using the KISS Method)
- Maintenance Process Maps align with CMMS
- Maintenance Dashboards/Scorecards are used to manage asset reliability
- Required data field entry
  - Actual Maintenance Labor Hours posted for on Work Orders before Closure
  - Work Order Close Out Requirements
  - Algorithm to assist Maintenance Scheduling based on Asset Criticality and Defect Severity
  - Automated Failure Reporting based on Maintenance Rework, MTBF of Critical Assets, etc.
  - Maintenance Technicians, Reliability Engineers, Maintenance Supervisors use of PDAs or Cell Phones with Barcoding ability to review equipment history on specific assets real time



# Top 7 Reasons Why CMMS Fail to Meet Expectations

1. An organization does not understand what Maintenance Best Practices looks like
2. Implementation oversold and under delivered
3. Needs of the Customer did not match what was delivered
4. Users do not use the CMMS as designed
5. No Maintenance Process Maps in order to align to CMMS
6. Maintenance Dashboards do not provide drill down
7. Equipment Hierarchy is not structured to meet customer's needs
  - Vertical and Horizontal Capability



# Alignment through Roles and Responsibilities

- Roles and Responsibilities are defined for all users of a CMMS because users have different Roles and Responsibilities
- Maintenance “Roles and Responsibilities” helps ensure all parties are aligned in use of a CMMS

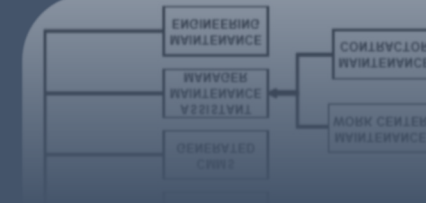
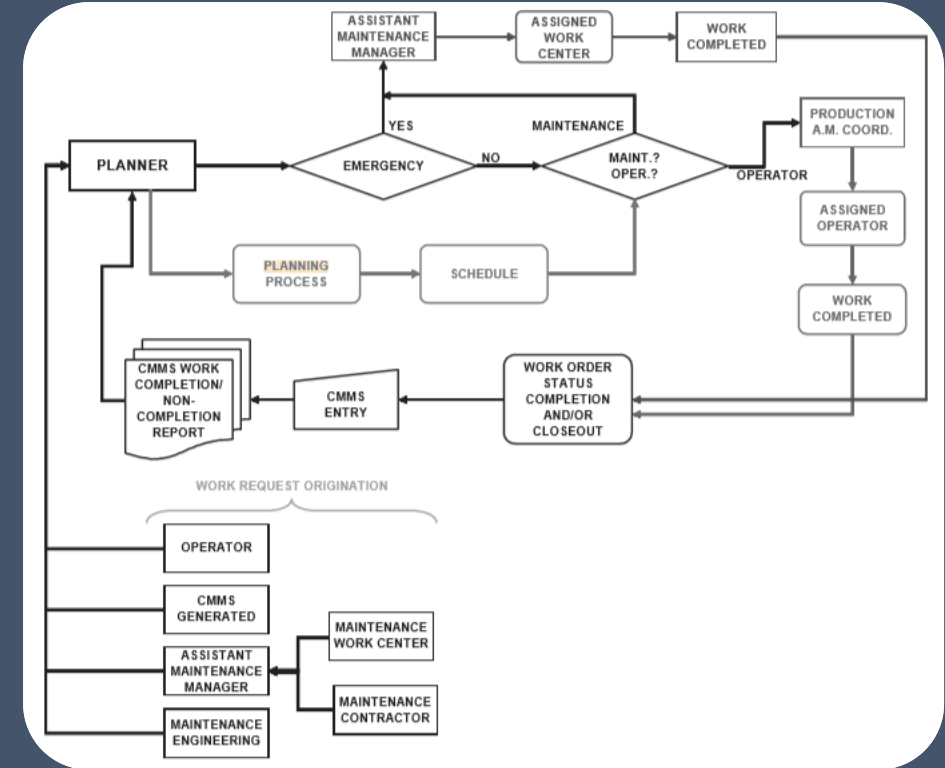
Task / Positions → ↓	Maint. Mgr.	Prod. Mgr.	Maint. Planner	Reliability Engineer	Stores Manager	CMMS Administrator	Plant Mgr.
Define Expected Outcome from CMMS	A	R	C	C	C	R	I
Verify Asset Hierarchy Source: ISO 14224	A	R	R	R	I	R	I
Walk down equipment / verify equipment data	A	C	C	R		R	I
Restructure Data if needed – Vertically/Horizontally	A	I	R	R	C	R	I
Verify Maintenance Process Maps are Optimized	A	R	R	R	R	R	I
Establish Leading/Lagging KPIs for all Maintenance Processes	A	I	R	R	R	R	I

<b>Responsibility</b> <b>Accountable</b> <b>Consulted</b> <b>Informed</b>	<b>“the Doer” (multiple people)</b> <b>“the Buck stops here (one person)”</b> <b>“in the Loop” (2 way Communication)</b> <b>“kept in the picture” (1 way Communications)</b>
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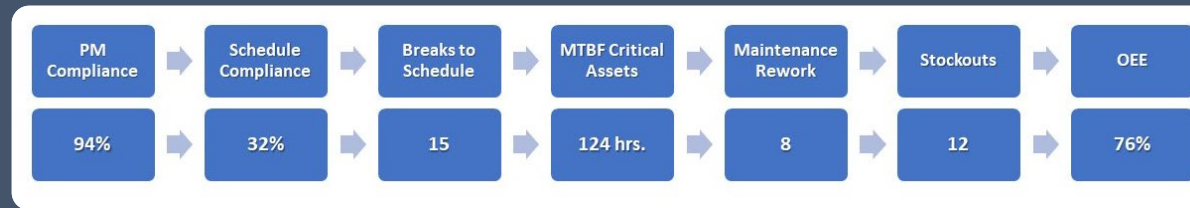
# What are the Minimum Requirements of a CMMS?

1. The Proactive Maintenance Process is Mapped and identified Roles and Responsibilities to ensure everyone understands the process
2. All assets are in the CMMS
3. Equipment Hierarchy and Criticality is defined and provides the ability to manage equipment reliability effectively
4. Everyone is trained in the use of the CMMS
5. A CMMS Users Guide is used to ensure it is utilized to specification
6. ALL Maintenance Work is charged to an asset via a Work Order
7. ALL Maintenance Techs day is charge to a Work Order and over 90% charged to an asset
8. Standing work orders are used for specific types of meetings or training ONLY
9. All Parts checked out of the storeroom is charged to a work order which is charged to an asset



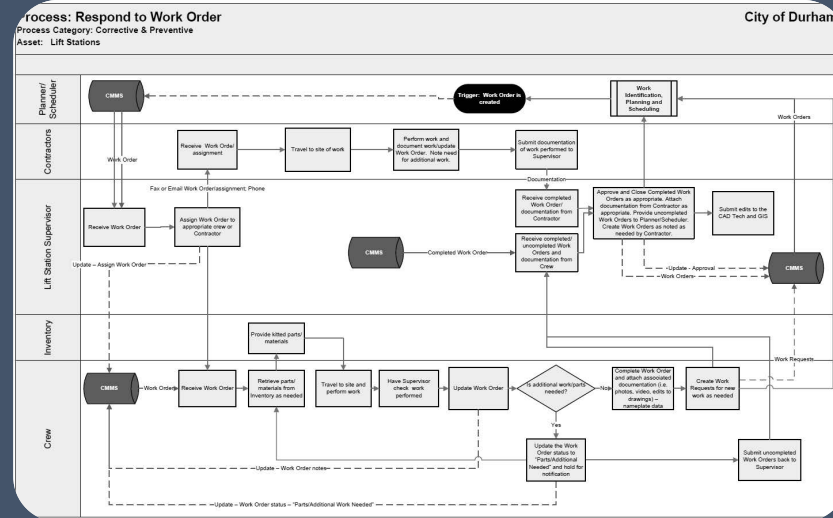
# Proactive CMMS Attributes

1. Easy to write a Work Request or Work Order
2. Easy to find parts in storeroom
3. Easy to find history of an asset when needed
4. Maintenance Dashboard is Accurate and Updated automatically



5. Maintenance Workflow Maps were used to ensure the Maintenance Process is aligned to ensure everyone to understand any process in Maintenance.

Equipment Block ID:			
Equipment Hierarchy:			
Project Description:			
Yearly PM			
Job Description:			
Perform PM on Hydraulic System			
Frequency: Yearly			
Estimated Craft Hours:		Estimated Elapsed Time:	
Estimated Production Downtime:			
Originator:	Tony Millsapp	Origination Date:	06/26/2018
Owner:	Maint Value Steam Ldr	Version #:	1
Previous Version(s) Modifications:			
Approval:	RS	Version #:	1.0
Warnings:			
Lock Out Tag Out - Could result in serious injury			
Cautions:			
Failure to follow procedures could result in product contamination			
Personal Protective Equipment Required: Safety Glasses, Clean Gloves, Hearing Protection			
Part # (Stores ID)	Part Description	Quantity	Quantity Description
Maintenance Shop	FMO-500-AW Oil	110	Gallons
Maintenance Shop	Lint Free Towels	2	Boxes
532140156	Oil Filter Element	2	each
Consumables Needed:			
Degreaser, paper towels			
Special Tools Required:			
Transfer Filter Pump			
Mobile/Special Equipment:			





# Proactive CMMS Attributes, cont.

## 6. Managing Asset Reliability and Maintainability with Data

### Data Requirements – Failure Data/Equipment Data “ISO 14224”

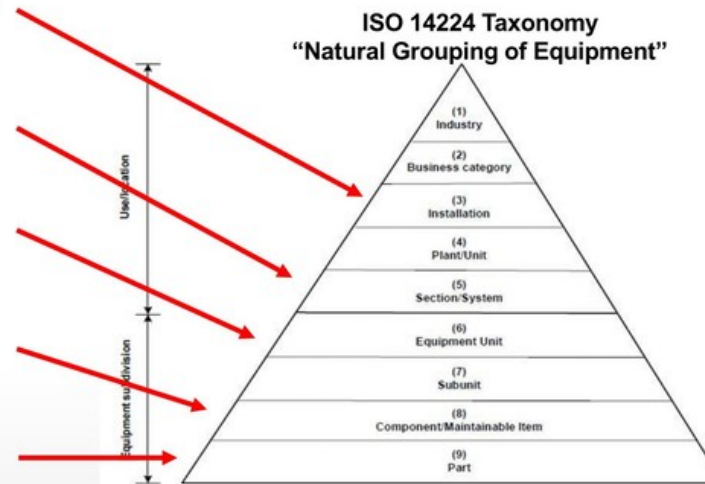
(3) Installation/Facility

(5) Section/Systems

(6) Equipment Unit

(8) Maintainable item

(9) Part



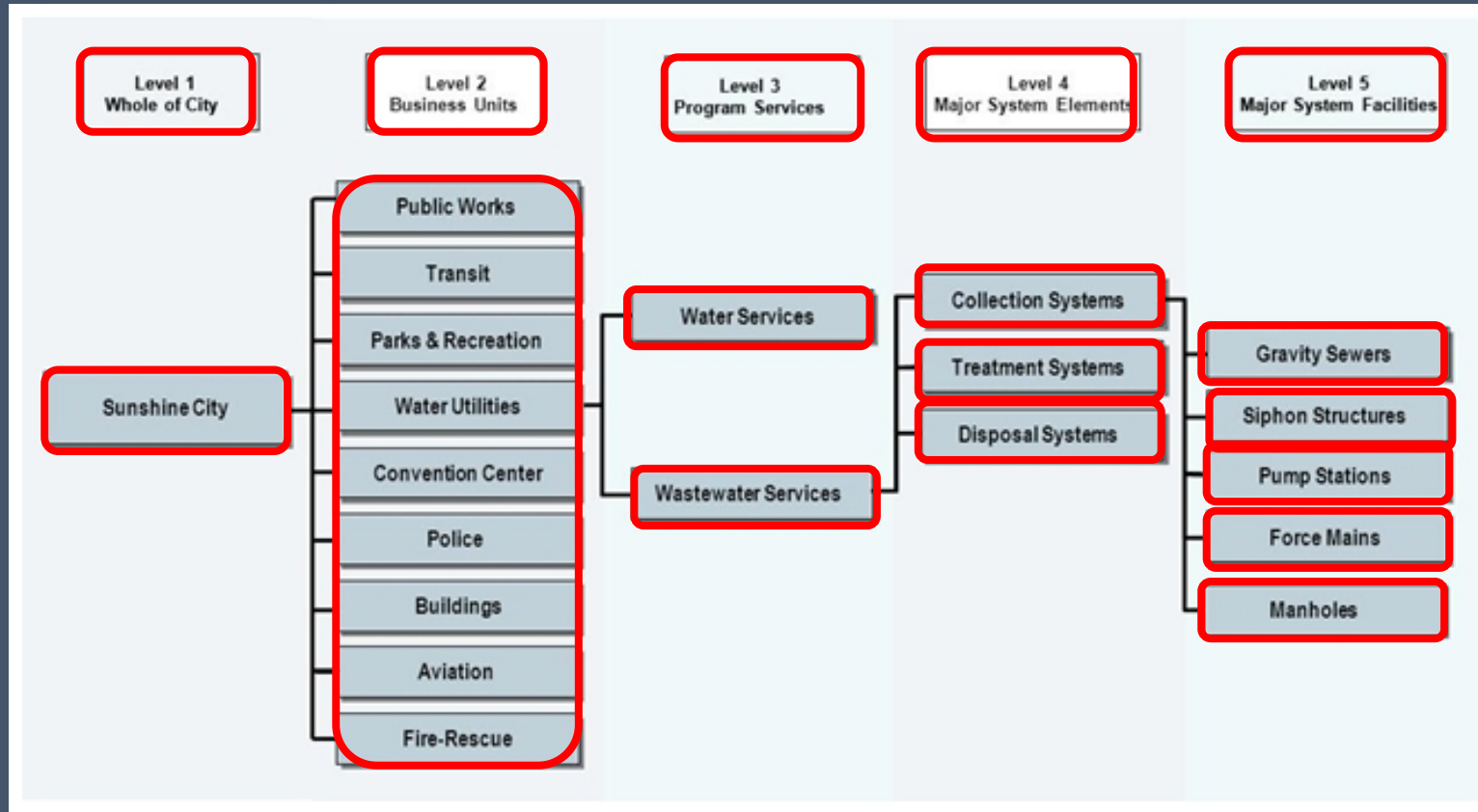
What is it you need to know?

- (3) In each specific facility
- (5) MTBF of each production line (production and equipment)
- (6) Cost per sub-unit of line
- (8) Gearbox rebuild and new purchase cost
- (9) Which part is turning the most



# Proactive CMMS Attributes, cont.

## 7. Equipment Hierarchy must be structured to ensure the assets are managed effectively



# Proactive CMMS Attributes, Cont.

## 8. Capability of Making Decisions based on Asset Criticality and Defect Severity

### Prioritize Work to be Planned/Scheduled



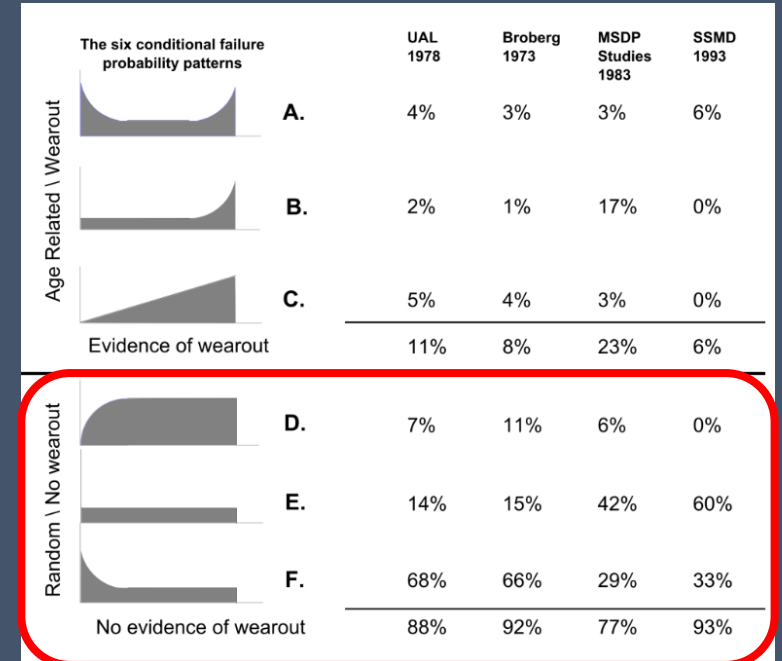
What work do you plan and schedule first?



# So how would you know if your CMMS is Effective or Not?

## “Look for These Symptoms”

- Decisions in Production and Maintenance are made based on accurate data not on passion
- Random Failures are LOW
- Maintenance Cost is stable
- Preventive Maintenance is conducted as a “Controlled Experiment”
- Stockouts in the storeroom are LOW
- Maintenance Wrench-time is high because Maintenance Planning and Scheduling is effective
- Employee morale is high



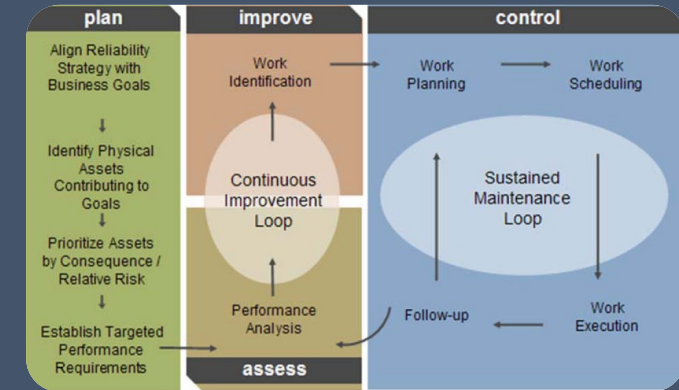
Maintenance Cost as % Replacement of Asset Value (Source: SMRP Glossary)

- World Class Wrench-Time = 55-65%
- Typical Wrench-Time = 15-25%
- Worst in Class Wrench-Time = 5-10%

- **Wrench-Time** is a measure of crafts personnel at work, using tools, in front of jobs.
- **Wrench-Time** does not include obtaining parts, tools or instructions, or the travel associated with those tasks.
- **It does not include** traveling to or from jobs.
- **It does not include** time spent obtaining work assignments.

# Options if your CMMS is not Meeting Expectations

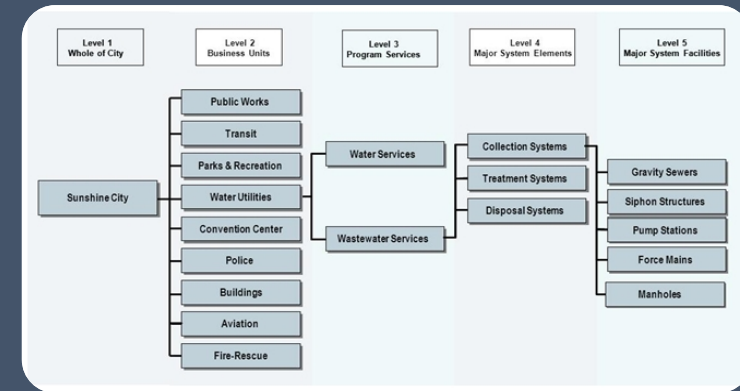
- Ask an expert to evaluate your current Maintenance Process and make recommendations how enhance performance to include the CMMS
- Identify what are your organization's requirements of a CMMS
  - Ability to **MANAGE** Assets based on Asset Criticality
  - Ability to **MANAGE** COST
  - Manage Maintenance Work **EFFECTIVELY**
  - Manage with **EFFECTIVE** KPIs and Dashboards
  - Work Order Priorities can be Defined
  - Defect Severity Process Defined





# Options if your CMMS is not Meeting Expectations, cont.

- Educate Leadership, Maintenance Techs, Planners, in Maintenance Best Practices and the value of the CMMS, etc.
- Verify all assets are in the CMMS and aligned to make the right decisions at the right time
- Rank all Assets based on Criticality



## Maintenance Best Practices / SMRP Body of Knowledge Workshop (3 Days) Live and Virtual

April 27-29, 2021

### What “you” should expect to take away from this training:

- Better understanding of Maintenance and Reliability Best Practices and how to apply in any organization.
- Recognition of the gaps in your Maintenance Organization and how to close those gaps.
- A simple plan one can implement when they return.
- Feel pride in your Maintenance Work through the knowledge one has gained.
- Less stress through new knowledge and skills gained.
- Possibly feel confident to take the CMRP Exam.

... and so much more



For more information:

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For more information:

Safety	Environment	Quality	Throughput	Customer Service	Operating Cost
40 = Multiple fatalities	40 = Potential for severe environmental damage	10 = Scrap cannot be reworked or sold as secondary product	10 = Unable to recoup loss to attain production quota—must reduce future order bookings	10 = Loss of customer or potential litigation	10 = Increased costs of more than \$500,000
38 = Fatality	32 = Potential for major environmental damage	8 = Out of specification, with rework can be sold as second at little or no profit	8 = Cannot make up lost production at facilities—have to purchase outside material or service	8 = Customer experiences downtime or excessive scrap loss, costs charged back	8 = Increased costs of more than \$100,000 but less than \$500,000
34 = Disabling injury	28 = Potential for significant environmental damage	6 = Out of spec, with rework can be sold as prime	6 = Lost production can be recovered within facilities but at additional cost (e.g., overtime) since no excess capability readily available	6 = Late delivery of majority of order quantity or customer rejects product as received	6 = Increased costs of more than \$50,000 but less than \$100,000
30 = Lost-time injury	20 = Minor or no environmental impact	5 = Out of spec, can be sold as seconds	4 = Can recover lost production through readily available excess capacity but has a significant impact on buffer inventory levels, putting other operations at risk of delay in supply	4 = Partial late delivery	4 = Increased costs of more than \$10,000 but less than \$50,000
20 = Minor injury such as contusions or lacerations	0 = No accidental release or emission	4 = Out of spec, can be reapplied to other prime order	2 = Lost production has no significant impact on buffer inventory levels	2 = On time delivery, but minor impact on order quality or quantity that the customer is willing to accept	2 = Increased costs of less than \$10,000
0 = No injury		2 = Production within spec but process out of control	0 = No lost production	0 = Quality, quantity, and delivery date as promised to the customer at time of order placement	0 = No increased operating costs are incurred
		0 = Process remains in control			

# QUESTIONS?

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