

Everything you may want to know about a Proactive Maintenance Storeroom

(but maybe you were afraid to ask)

By Radar Huntsinger and Ricky Smith



What is a Maintenance Storeroom?

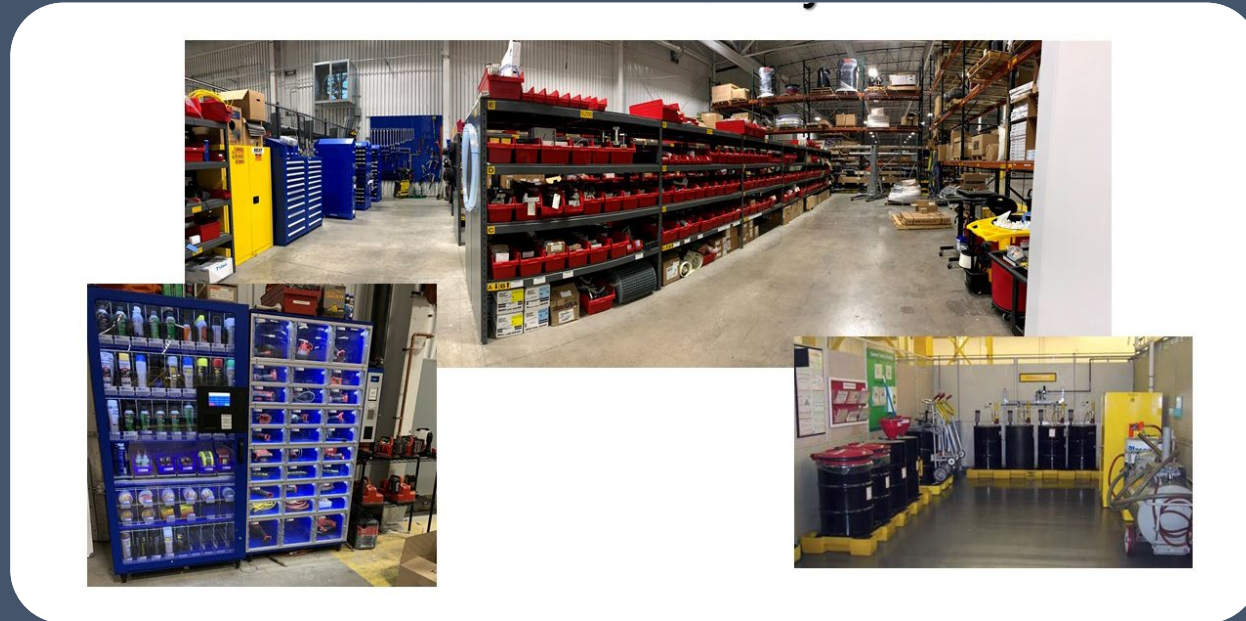
- A maintenance storeroom is a storage area for maintenance parts, repair parts, and operating supplies (known as MRO).
- It stores parts and supplies for future use to avoid prolonged downtime, which could ultimately lead to a plant shutdown.

What is the Objective of Maintenance Storeroom?

The storeroom's function is to manage the inventory investment and provide the needed parts and components for equipment repairs and support the objectives and goals of the organization.

The Objective of a Maintenance Storeroom

“To Provide the Right Part/Material at the Right Time in like new condition to Maintenance”



A worker wearing a white hard hat, safety glasses, and a dark t-shirt is focused on working on a large, complex piece of industrial machinery. The worker is positioned in the foreground, slightly to the left, and is looking down at the equipment. The background shows a storeroom filled with various pieces of machinery and equipment, including a large white cylindrical tank and other industrial components. The lighting is somewhat dim, highlighting the worker and the machinery they are working on.

Mission of the Maintenance Storeroom

The Maintenance Storeroom is to enable equipment reliability through an effective Storeroom Management Process

World Class Maintenance Benchmarks

Stocked Maintenance, Repair and Operating Materials (MRO) Inventory Value

The current book value of maintenance, repair and operating supplies in stock, including consignment and vendor-managed inventory. Include value of MRO materials in all storage locations including satellite and/or remote storeroom locations whether or not that material is included in inventory asset accounts or an allocated portion of pooled spares.

(Estimate the value of “unofficial” stores in the plant even if they are not under the control of the storeroom and even if they are not “on the books”.) Include estimated value for stocked material that may be in stock at zero value because of various maintenance management system (MMS) and/or accounting idiosyncrasies, etc. DO NOT INCLUDE raw material, finished goods, packaging materials and related materials.

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%
Example of Cost Differences between WCM and Typical Organizations	\$220,000	\$48,0000

MRO Definitions

“Without a Definition We have Everyone’s Opinion”

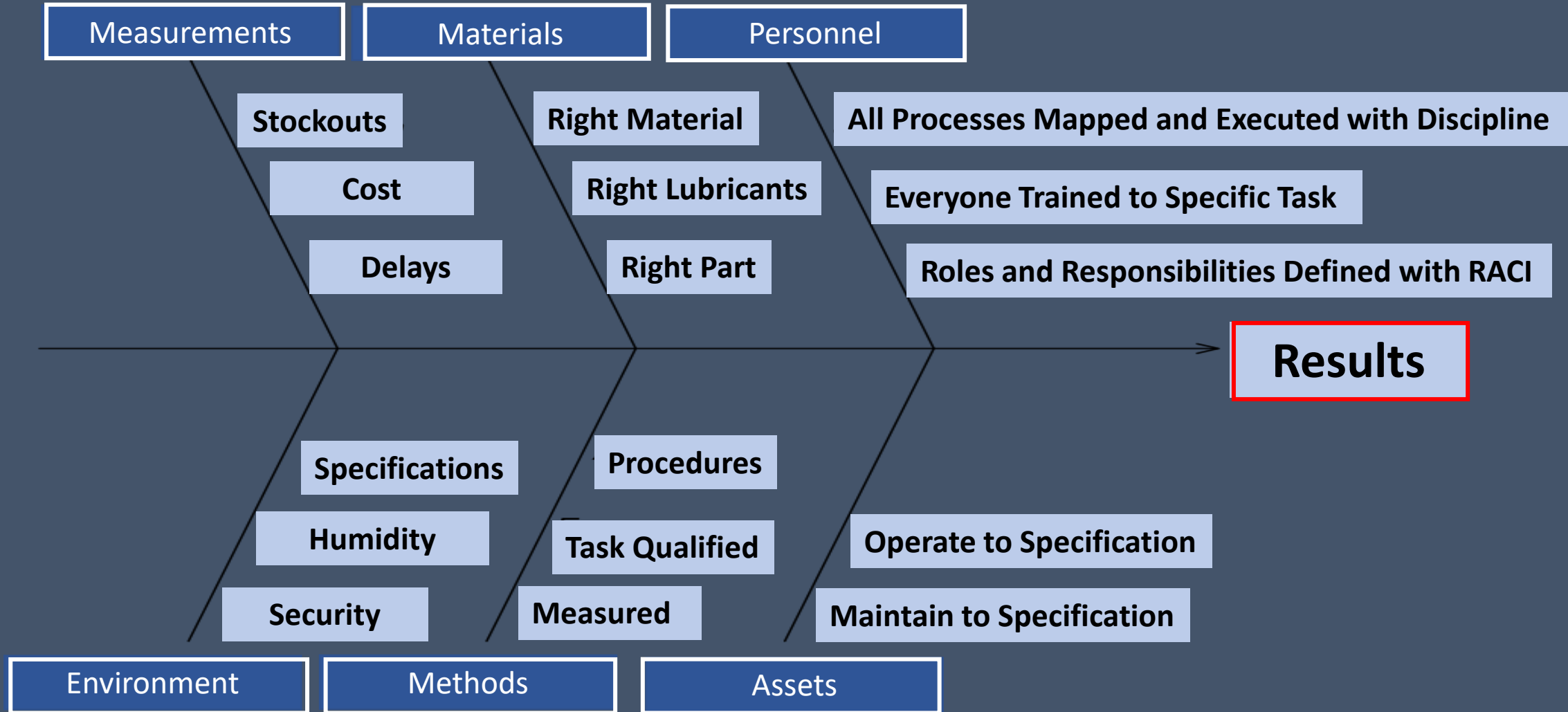
1. Planned work is work that has gone through a formal planning process to identify labor, *materials*, tools and safety requirements. This information is assembled into a job plan package and communicated to craft workers prior to the start of the work.
2. READY WORK is work that has been prepared for execution, i.e. necessary planning has been done, materials procured, and labor requirements have been estimated.
3. Stock Out is an inventory request is a stock out if the requested item is normally stocked on site and the inventory request is for a normal quantity of the item, but the inventory on hand is insufficient to fill the request.
4. Inventory Accuracy is an inventory cycle counting process identifies discrepancies in inventory levels and corrects inventory quantities before those items are requisitioned for an equipment repair.
5. The target for an MRO storeroom should be to have an overall inventory accuracy of 95% of total cycle counts.

Maintenance Storeroom Guiding Principles

1. Controlled access 24/7
2. Min/Max/Reorder Point is used to manage parts in order to mitigate stockouts
3. Stockouts are managed and considered unacceptable
4. First in, Last out when checking out parts
5. No used parts or material are stored unless they have been restored to “manufacture's specification



Contributing Factors to Spare Parts Problems/Issues



Requirements for Success of Inventory Control

1. Secured Storeroom 24/7
2. All parts charge to a Work Order which assigned to a specific asset
3. No remote stores that is not controlled
4. No “hidden spares” (legal tax issue)
5. Preferred bar code scanner, scan part, scan work order, download information into CMMS .

Inventory Performance Indicators

- Item turnover rate – increasing / decreasing (trend)
- Stock out - less than 5% (Service level > 95%)
- Inventory accuracy - > 95%
- Slow moving parts - < 5%
- Emergency purchases - (\$) Overnight or expediated cost
- Back-Orders - < 5%
- Vendor Efficiency (on-time % x right quantity% x right part %) 90% plus
- Vendor Owned Inventory % Less than 5% ?

What does a good storeroom look like?

- Clean and Organized
- Right part at the right time
- Secure 24/7
- Parts are charged to an asset/work order
- Cycle Counting Monthly
- Adequate conditioned air for specific assets
- Large HP Motor (50hp or larger) shafts are turned monthly 1-1/4 turns
- Fast moving parts at the front
- Secure kitting area separate for schedule work, daily and outage (location or parts/material have WOs tagged to them)

- **Cycle counting** is a popular inventory **counting** solution that allows businesses to **count** several items in several areas within the warehouse without having to **count** the entire inventory.
- **Cycle counting** is a sampling technique where the **count** of a certain number of items infers the **count** for the whole warehouse.

7 Habits of an Effective Maintenance Storeroom Leader

1. Ensures all maintenance parts checked out are charged to an Asset via a Maintenance Work Order (no work order, no parts)
2. Monitors Storeroom Leading and Lagging KPIs and makes decisions based on data
3. Ensures the storeroom is secure and monitored 24/7 (cameras)
4. Applies technology to manage storeroom effectively (barcodes, handheld devices)
5. Attends Maintenance Scheduling meeting (30 minutes a week)
6. Brings in vendors to provide free training to maintenance technicians
7. Rebuild items are shipped to rebuild facility within 48 hours

What are the Indicators of “Poor Storeroom Practices”

- Housekeeping is one of the first indicators of how a storeroom is running. If the aisles are cluttered or disorganized, stock in the bins is not rotated to allow First In First Out (FIFO), and packages are torn or show leakages, it indicates that storage and care is not happening.
- If you are having stock outs on a recurring basis and stock is still showing in inventory, it is an indication of poor inventory management.
- If you are experiencing expedites for material already on order, it is an indication that either the suppliers are not meeting their due dates or the buyers are not paying attention to your needs.
- Parts and Material are not charged to a Work Order / Asset. All parts must be checked out the storeroom and charged to an asset
- No kitting for scheduled / future maintenance work

The Benefits of Having a Clean and Efficient Storeroom

- When your MRO storeroom is clean and runs efficiently at a lower cost, your company can recognize more revenue. But what other benefits are there?
- Find parts faster—You'll spend less on labor wasted in looking for lost or missing parts. Also, by accelerating the overall MRO process, you'll have less downtime of valuable equipment and operators.
- Lower freight, shipping, and handling costs—You'll lower these costs because you won't be ordering parts you already have, and you'll have less expedited/rush shipping costs.
- Less inventory carrying costs—You can shrink your inventory of parts by determining what's obsolete and unnecessary. As time goes on, you'll order and stock only what has the biggest impact on operations.
- Maximize the use of available space—By reorganizing and removing unnecessary parts, you'll have room to make the workspace more efficient. You might even be able to reclaim some of that area and use it for income-producing purposes.

Elements of a Great MRO Storeroom

- **Goals and objectives** – what are your goals and objectives for the storeroom?
- **Personnel** – do you staff your storeroom 24/7 or is a process in place where all parts are kept secure?
- **Technology** – is your current CMMS have all parts assigned to specific assets?
- **Security** – Is storeroom locked or controlled 24/7?

How to Be Proactive with Stores Through an Evaluation

- **What is the best way to be proactive and evaluate your storeroom?**
- **The best way to evaluate your storeroom is to walk through it daily and review the list of items below:**
 - **Check 10 part numbers and verify CMMS vs Actual. What is the variance from the CMMS and on-hand balance?**
 - **In order management, how many orders are able to be filled and meet the daily requirements? Review the orders produced from the day before and note the number of shortages.**
 - **Look at your kitting staging area. Are the kits being filled daily and rotating daily, or are they lingering for a week or more.**
 - **Do you notice non-authorized persons in your storeroom looking at stock, shopping, or filling their own orders? What are your in/out controls and how are they working for you?**
 - **Finally, ask your storeroom if they have any issues with suppliers or buyer response. The answers may surprise you.**

Storeroom Goals

Before you dive in and start fixing things, it's better to first set some goals and priorities based on your company's immediate needs and resources. Just some of the considerations include:

- Number of storerooms and SKUs you have
- Production and maintenance schedules
- The activity level of each shift
- Number of personnel you can devote to the project
- Also, to see progress, you'll need some baseline information.
- Make sure you capture the current state of the storeroom with photos, report data, and so forth.
- If possible, have your MRO storeroom's baseline evaluated. This makes it easier to measure how far you've come and the return on your investment.

Storeroom Requirements

1. **Store only parts must be linked to an asset, an exception for operating supplies.**
2. **Promote physical security for your parts; treat them as you would a checkbook.**
3. **Staff or control your storeroom for the same hours as production operates.**
4. **Ensure that each part number is assigned a Min/Max/Re-order Point and are reviewed regularly.**
5. **Measure your storeroom performance.**
 - **Stockouts**
 - **# of times someone's enters storeroom and does not check out a part**
 - **Storeroom Value**
 - **Inventory turns by part / component type**
 - **Measure MTBF of Critical Components by type and size**

Materials Management Metrics

5.5.32 Vendor Managed Inventory (Source: SMRP Metrics)

A. DEFINITION

- This metric is the ratio of the number of stocked items measured as individual stock keeping units (SKUs) that are managed by a vendor or supplier to the total number of stocked items held in inventory.

B. OBJECTIVES

- The objective of this metric is to quantify the amount of maintenance, repair and operating supplies (MRO) stock that is vendor managed.

Materials Management Metrics

Source: SMRP Metrics

5.5.34 Inactive Stock

A. DEFINITION

- This metric calculates the ratio of the number of inactive maintenance, repair and operating (MRO) inventory stock records to the total number of MRO inventory stock records, excluding critical spares and non-stock inventory records.

B. OBJECTIVES

- The objective of this metric is to measure the percentage of non-critical MRO supply stock with no usage for 12 or more months.
- A secondary objective is to *use this information to calculate the potential for a reduction in working capital through changes in stocking levels (e.g. deletion, reduction in the quantity on hand, etc.).*

Materials Management Metrics

5.5.33 Stock Outs

A. DEFINITION

- This metric is a measure of the frequency that a customer goes to the storeroom inventory system and cannot immediately obtain the part needed.

B. OBJECTIVES

- This metric is used to maintain the appropriate balance in stocked inventory. Too much inventory increases working capital unnecessarily. Too little inventory results in unnecessary delay and equipment downtime that can negatively impact costs and profits.

Maintenance Storeroom Gemba Walk – “Awareness”

The Maintenance Gemba Walk is an opportunity for Maintenance Staff to stand back from their day-to-day tasks to walk through storeroom facilities to identify wasteful activities.

Examples:

- Maintenance Leadership (once a month/quarter), with the storeroom manager and maintenance planner to identify problems in the storeroom, ie. Lack of security in storeroom, used parts in place of where new parts should be, rebuilt items not sent out for rebuild, etc.
- Maintenance Leadership (once a quarter), with Production Leadership (and once a year with Plant Manager) to identify problems with production and maintenance practices, ie. Production personnel not operating the equipment to specification, maintenance personnel standing around waiting for scheduled equipment to shut down, storeroom in chaos (high value components not stored to specifications, etc.)



Wrong Coupling Ordered



Used Motor in Storeroom?



Plant Spill because wrong part

6s for Storeroom

6S is a workplace organization method that uses a list of five Japanese words: seiri, seiton, seisō, seiketsu, and shitsuke. These have been translated as "sort", "set in order", "shine", "standardize" and "sustain", "Security"

The 6s are Sort, Set in order, Shine, Standardize, Sustain, Security

1. Seiketsu —Sort (remove unnecessary items)

“remove parts which are no longer used”

2. Seiri —Straighten (organize)

“sort and store parts based on A-B-C analysis”

3. Seiso —Scrub (clean everything)

“Keep all parts, storeroom clean, and climate controlled”

4. Seiton —Standardize (standard routine to sort, straighten and scrub)

“Eliminate redundant parts, fast turn parts in front, part types stored in same area and buy from qualified vendors not lowest bidder”

5. Shitsuke —(Sustain) (expand the process to other areas)

“Stores parts in secure areas with new ideas”

6. Security – Control access, Secure all parts with Cameras, Secure Access via Employee card



Storeroom Inspection Tagging Process

The Objective of this Process:

“To identify areas/issues in spare parts management”

Step 1: Assemble a team, storeroom, maintenance leadership plus 2 techs (electrical/mechanical) production leadership, and reliability engineer

Step 2: Review storeroom metrics from the last 60-90 days

- Stockouts
- Material Cost Trend
- PM Compliance of Critical Spares
- Overnight Delivery cost

Step 3: Inspect the storeroom as a team and post tags on parts using the criteria below

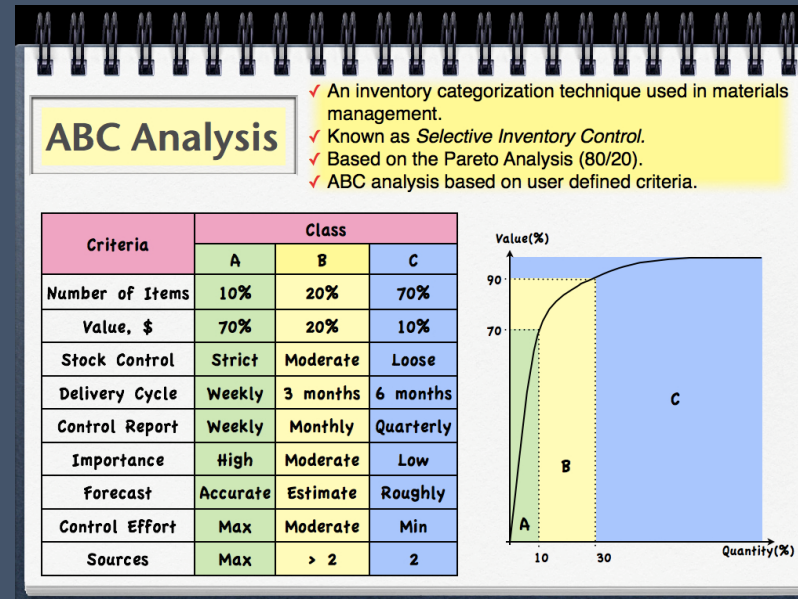
- Keep in place - Green
- Keep but move to a different specific areas - Yellow
- Discard - Red
- Reorganize - Blue
- Uncertain - Orange

Parts ABC Analysis

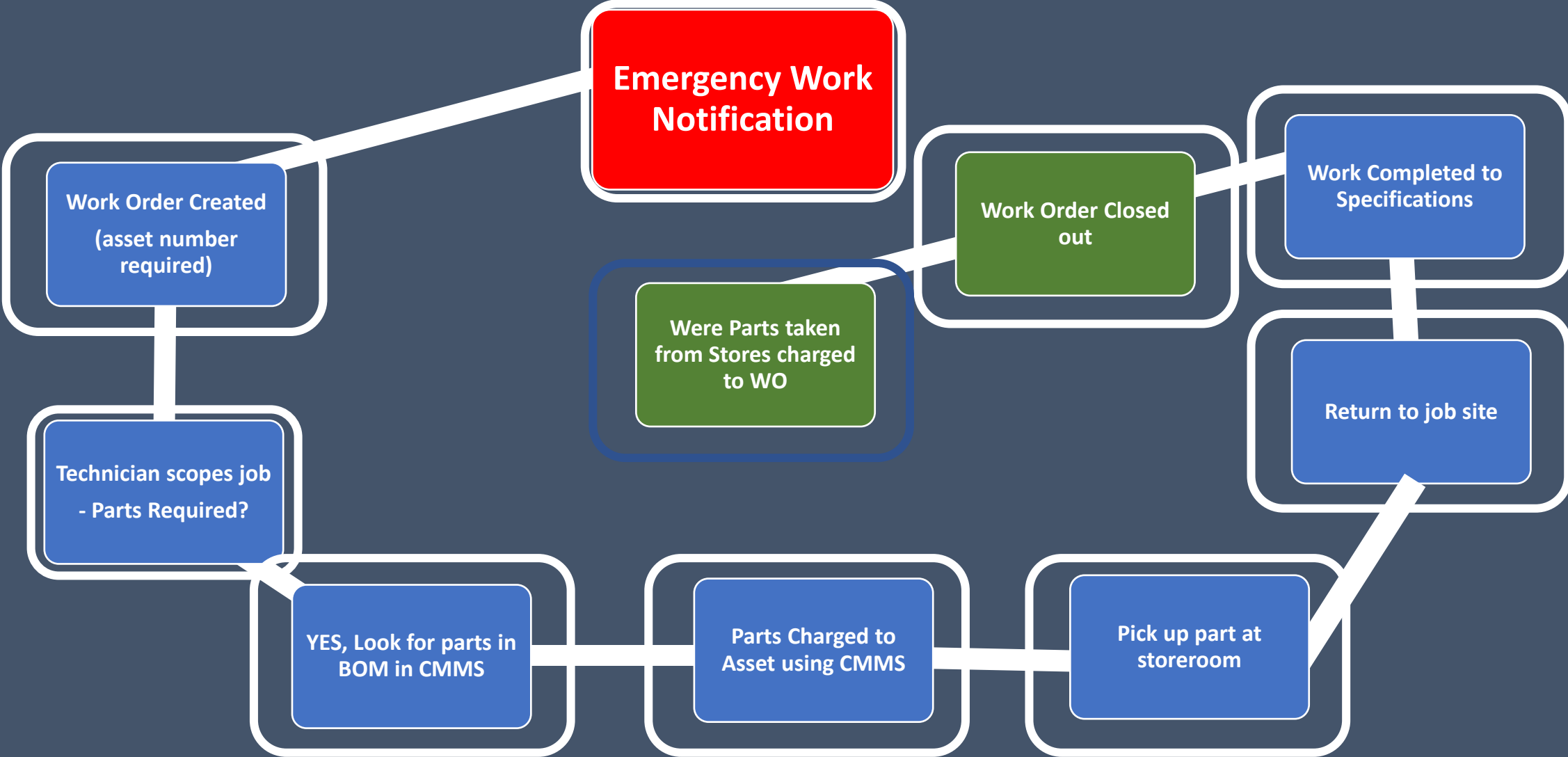
"A" Category items generally represent approximately 15%-20% of an overall inventory by item, but represent 80% of value of an inventory. By paying attention close attention in real-time to the optimization of these items in inventory, a great positive impact is possible with minimal increase in inventory management costs.

"B" Category items represent 30%-35% of inventory items by item type, and about 15% of the value. These items can generally be managed through period inventory and should be managed with a formal inventory system.

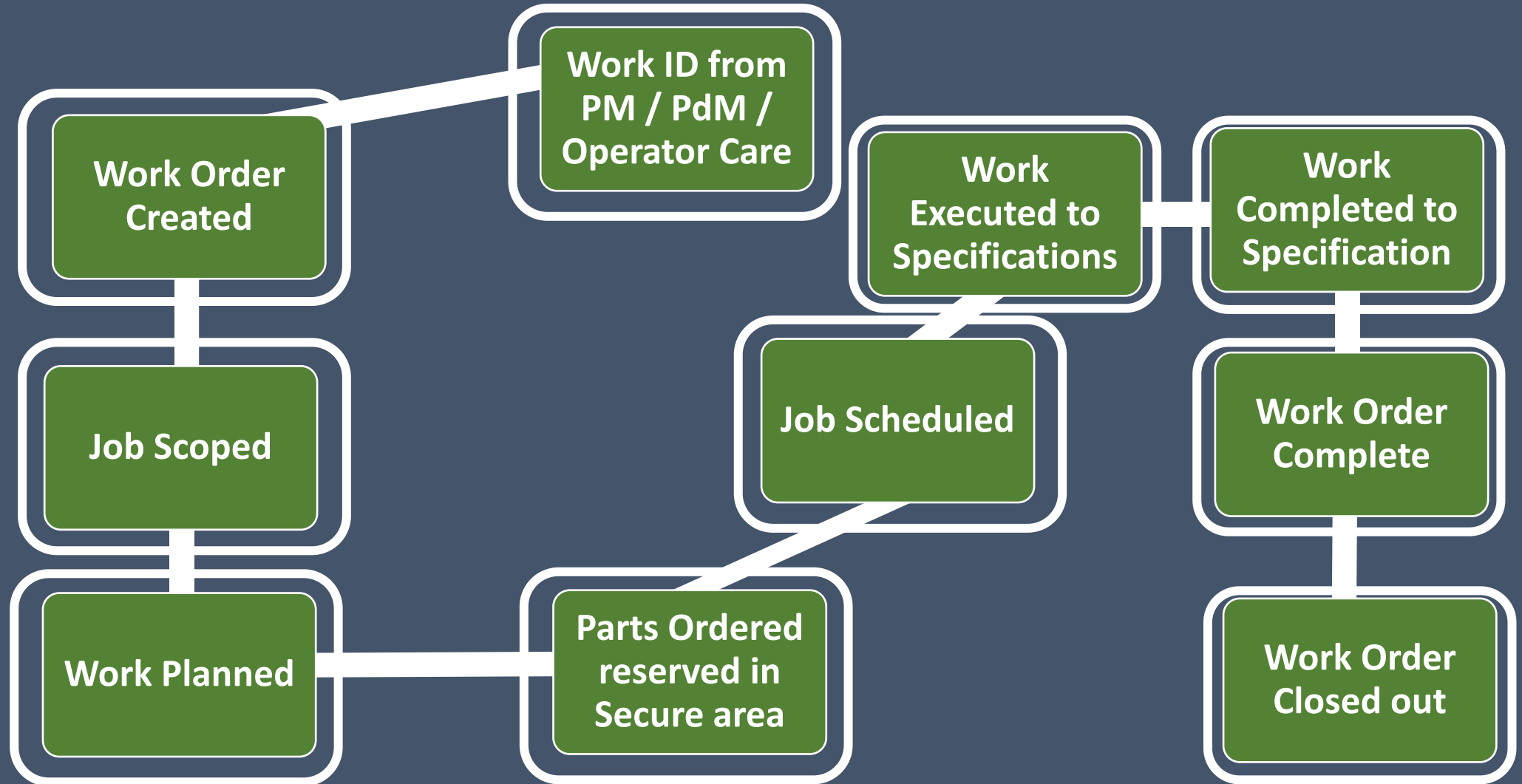
"C" Category items represent 50% of actual items but only 5% of the inventory value. Most organizations can afford a relatively relaxed inventory process surrounding these items.



Emergency Work – Parts Obtainment



Proactive Maintenance – Parts Obtainment



Next Steps for Storeroom Optimization

- Agree on Master Plan with Quick Wins along with targets and goals

Lean Maintenance Master Plan Example

Task	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Lean Maintenance Education	X											
Create a Lean Maintenance Master Plan	X											
Define Roles and Responsibilities	X											
Update / Create Maintenance Process Maps												
Verify CMMS is Fully Functional		X										
Create KPI Dashboards			X									
Identify Major Losses		X										
Create a Master Plan "Crawl, Walk, Run"	X											
Implement Lean Maintenance			X									
Measure and Adjust as needed	X	X	X	X	X	X	X	X	X	X	X	X

- Develop RACI Chart in order to define Roles and Responsibilities
- Establish Leading and Lagging Metrics

Maintenance Storeroom Management

Tasks	Site Leadership	Purchasing Manager	Trident Storeroom Manager	Maintenance Technician	Stores Attendant	Maintenance Management	Vendors
Part / Material received to SOP	I	C	A	C	R	C/I	C
Did Part Match PO? Yes - Move to next step No - Put aside		C	A		R		C
Part / Material Location Identified • Kit-as-Planned Work • Store Stock		I	A		R	C/I	
Part / Material set in place designated by CMMS		I	A		R	I	
Parts / Material Stored to Specifications		C	A		R		
Parts checkout and Charged to an Asset	I	I	C	R	R	A	
Security of Storeroom	A	R	R		R	C	I

R Responsibility
A Accountable
C Consulted
I Informed

"the Doer"
"the Buck stops here"
"In the Loop"
"kept in the picture"



BEST MAINTENANCE TECHNICIAN PRACTICES

THREE DAY WORKSHOP

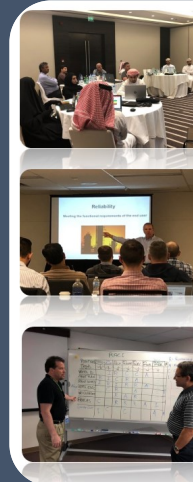
DATE: FEBRUARY 23-25

PRICE: \$750USD/PERSON

RSVP OR REQUEST MORE INFO BY EMAILING
RSMITH@WORLDCLASSMAINTENANCE.ORG



Questions?



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:

Email: rsmith@worldclassmaintenance.org

Website: www.worldclassmaintenance.org

Preventive Maintenance Best Practices plus PM Optimization Workshop

March 23-25, 2021

Hosted Live at Southern Wesleyan University and virtually via ZOOM (internet)

For more information send request to:
rsmith@worldclassmaintenance.org



Want a copy of the slides? Go to www.worldclassmaintenance.org