

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

May 18-20, 2021

Maintenance Best Practices / SMRP Body of Knowledge Workshop will provide any organization proven methods and concepts to help their organization obtain a highly level of Maintainability and Reliability.

This is an interactive training course covering Maintenance and Reliability Best Practices as defined by the Society for Maintenance and Reliability Professionals (SMRP) Body of Knowledge (BOK) and so much more. The objective of this program is to equip participants with current maintenance best practices and provide them with knowledge which will better prepare them for the CMRP, (Certified Maintenance and Reliability Professional) exam for maintenance and reliability professionals at all levels.

Known Best Maintenance Practices will be defined and demonstrated, along with numerous “hands on exercises) to enhance learning, and attendees will work in groups on real-world issues in each functional area in maintenance and reliability allowing learning from the instructor and fellow attendees.

Each attendee who plans to take the CMRP Exam will be provided a location (near to them) where they take the exam any time after the workshop.

#### Cost:

❖ Workshop plus SMRP Membership / CMRP Exam \$1300.00USD

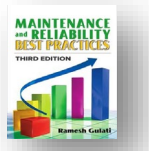
❖ Workshop only \$750.00 USD

#### Location:

- ❖ Virtual: via Zoom (Internet)
- ❖ Live: Southern Wesleyan University in Central, SC – 4 Miles from Clemson, SC or 40 miles from Greenville/Spartanburg Airport

#### Recommended Reference Material for CMRP Exam:

- Maintenance Best Practices (3<sup>rd</sup> Edition) by Ramesh Gulati (\$170.00 USD)



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

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

... and so much more

#### **What should “your leadership” expect to see when you return?**



- A more confident professional based on knowledge gained in the training.
- A simple plan with “quick wins” and long-term sustainment
- A simple but effective Maintenance Dashboard which can be implemented.
- Procedure Templates and other items which can be used upon return.



# Day 1: Maintenance and Reliability

## Day 1: Maintenance and Reliability Overview

- ❖ Instructor and Attendee Introductions
- ❖ Expectations from training
- ❖ Expectations from each attendee
- ❖ Expectations from instructor
- ❖ Daily Training Schedule
  - Pre-Test
- ❖ Definition of Maintenance
- ❖ Definition of Reliability
- ❖ What does “World Class Maintenance” look like and where was it created?
- ❖ World Class Maintenance Benchmarks
- ❖ Maintenance Leading and Lagging KPIs
- ❖ Work Identification
- ❖ Definition and expectations from PM and PdM
- ❖ The PF Curve and How does it Work.
- ❖ Repeatable Procedures
  - Repeatable Procedure Exercise
- ❖ The RACI Model to define Roles and Responsibilities.
  - RACI Exercise

Task	Position	"Roles and Responsibilities"						
		Asset Mgr	Facility Engr	Control Sup	Maint Techn	Maint Planner	Prod Mgr	Plant Mgr
Create / Manage Asset Criticality		C	R	C	I	I	C	A
ID all Components		A	R	C	R	C	R	I
ID how each Component will Fail		A	R	C	R	R	C	
Write Repeatable PM Procedures		A	R	C	R	C	C	
Measure / Monitor PM Effectiveness		A	R	C	C	R	C	I
Modify PMs		A	R	R	R	C	C	I
Manage Maintenance Dashboard (Leading / Lagging KPIs)		A	R	R	I	C	I	I

Responsibility Legend:  
 Responsible: "The Doer" (could be more than one)  
 Accountable: "The Buck Stops Here" (One person only)  
 Consulted: "Two-way communication" (In the Loop)  
 Informed: "One-way communication" (Out of the Loop)

## Preventive Maintenance

- ❖ Failure Modes and how to manage and mitigate them
- ❖ Developing and Managing a PM Program/Process
- ❖ Steps required to develop an Effective PM Program
- ❖ Writing a Repeatable/Effective PM Procedure
- ❖ Preventive Maintenance Roles and Responsibilities (RACI)
- ❖ Managing a PM Program
- ❖ Preventive Maintenance Leading and Lagging KPIs
- ❖ 14 Steps of a PM Optimization Process
- ❖ How to Manage a PdM Program
  - Preventive Maintenance Exercise
- ❖ CMRP Practice Test

## Predictive Maintenance (PdM) / Condition Monitoring (CBM)

- ❖ Definition of PdM and CBM
- ❖ The Objective of PdM / CBM
- ❖ Vibration analysis
- ❖ Ultrasonic analysis
- ❖ Infrared analysis
- ❖ Oil analysis
- ❖ Laser-shaft alignment
- ❖ Motor circuit analysis
- ❖ Non-Destructive Testing
- ❖ Day 1 Review
- ❖ 2 things you learned today.

# Day 2: Workflow Process plus CMRP Study

- ❖ Review of Day 1
- ❖ Benefits of Becoming a CMRP
- ❖ CMRP Review
- ❖ SMRP Metrics
- ❖ SMRP Body of Knowledge (BoK)
- ❖ CMRP Practice Questions
- ❖ World Class Maintenance (Alumax Mt Holly – John Day PE, one of the founding members of SMRP)

## Maintenance Planning

- ❖ Maintenance Planning Definition
- ❖ Maintenance Planning Workflow
- ❖ Maintenance Planning Leading and Lagging KPIs
- ❖ Maintenance Planning Roles and Responsibilities

## Maintenance Scheduling

- ❖ Maintenance Scheduling Definition
- ❖ Maintenance Scheduling Workflow
- ❖ Maintenance Scheduling Roles and Responsibilities (RACI)
  - Maintenance Planning and Scheduling Exercise

## Work Execution

- ❖ Work Execution Definition
- ❖ Work Execution Leading and Lagging KPIs
- ❖ Work Execution Roles and Responsibilities (RACI)

## Work Order Closeout

- ❖ Work Order Close Out Definition
- ❖ Work Order Close Out Leading and Lagging KPIs
- ❖ Work Order Close Out Roles and Responsibilities (RACI)

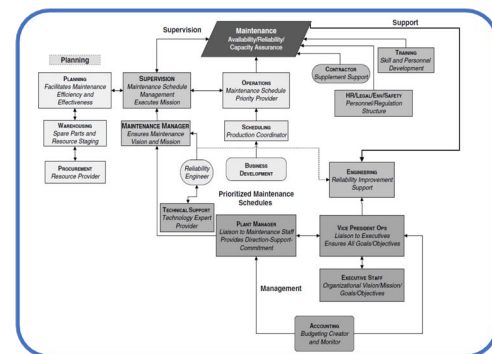
## Maintenance Dashboards

- ❖ Objective of Maintenance Dashboards
- ❖ Maintenance Dashboard Fundamentals
- ❖ Steps to Creating a Maintenance Dashboard

## CMRP Practices Exam – Timed

## SMRP Information You May Want to Know

- ❖ GFMAM Asset Management Landscape
- ❖ IAM Competency Framework
- ❖ ENGINEERING RELIABILITY FAULT TREES AND RELIABILITY BLOCK DIAGRAMS by Harry G. Kwatny
- ❖ ADKAR (Book) A Model for Change in Business, Government, and our Community
- ❖ SMRP Definitions
- ❖ SMRP Body of Knowledge Overview
- ❖ How long it takes to receive CMRP Results.
- ❖ CMRP Practice Questions
- ❖ How to Prepare for the exam
- ❖ Questions about the CMRP Exam and where to take the Exam



- ❖ Failure Reporting, Analysis, and Corrective Action System (FRACAS)
- ❖ Best Maintenance Repair Practices
- ❖ How to Maintain Mechanical Components
- ❖ How to Maintain Electrical Components
- ❖ 2 Things one learned from today.
- ❖ CMRP Practice Test
- ❖ How to study for the CMRP Exam

## Day 3: SMRP BODY OF KNOWLEDGE



The SMRP Body of Knowledge (BoK) is a roadmap to world-class performance in maintenance, reliability, and physical asset management.

### Pillar 1: **Business & Management**

- ❖ Create a strategic direction and plan for Maintenance and Reliability Operations
- ❖ Vision, Mission, and Strategic Plan to achieve business goals.
- ❖ Maintenance and Reliability Leaders utilize knowledge of industry benchmarks to establish goals.
- ❖ The Value of Effective Metrics (SMRP Metrics)
- ❖ Managing with Leading and Lagging KPIs which measure the direction and success of Maintenance and Operations.
- ❖ Safety and Environmental issues are Critical to Success.

### Pillar 2: **Manufacturing Process Reliability**

- ❖ Maintenance is critical to ensuring success of Manufacturing Processes.
- ❖ Manufacturing Process Reliability Principles
- ❖ Process Flows are defined.
- ❖ Continuous Improvement through Lean Six Sigma
- ❖ KPIs - Operation Driven Reliability (ODR), OEE and TEEP
- ❖ Management of Change and Change Management Protocols

### Pillar 3: **Equipment Reliability**

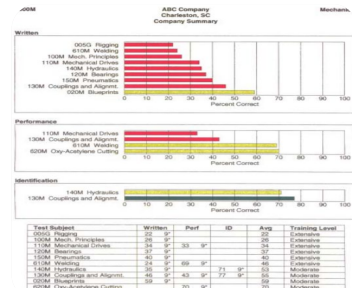
- ❖ Activities that apply to equipment and processes for which maintenance is accountable.
- ❖ Access current capabilities of equipment and processes in terms of reliability, maintainability, availability, and criticality

- ❖ Activities selected to apply the most appropriate maintenance practices, so they deliver capabilities in the safest and most cost-effective manner.
- ❖ Equipment performance expectations analyzed through methods such as Root Cause Analysis, Weibull Analysis, etc.
- ❖ Nominal design parameters and best demonstrated performance are evaluated and compared to inherent design.
- ❖ Defining Predictive and Condition Based Maintenance
- ❖ Understanding the application of Predictive (PdM) and Condition Based Maintenance Technologies to include
  - Vibration Analysis
  - Infrared Thermography
  - Ultrasonic Testing
  - Lubrication and Wear Particle Analysis
  - Electrical Condition Monitoring
  - Non-Destructive Testing
- ❖ What is Design for Reliability, Availability, and Maintainability?
  - Key Terms and Definition
  - Reliability Block Diagram
  - The Failure Curves
  - Reliability Distribution
  - Asset Life Cycle Cost

The six conditional failure probability patterns		UAL 1978	Broberg 1973	MSPD Studies 1983	SSMD 1993
Age Related / Wearout	A.	4%	3%	3%	6%
	B.	2%	1%	17%	0%
	C.	5%	4%	3%	0%
Evidence of wearout		11%	8%	23%	6%
Random / No wearout	D.	7%	11%	6%	0%
	E.	14%	15%	42%	60%
	F.	68%	68%	29%	33%
	No evidence of wearout		88%	92%	77%

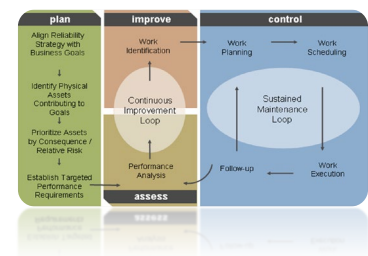
#### Pillar 4: Organization and Leadership

- Organizational structure and alignment to the strategic plan
- Skills, Competency and Performance analysis
- Job Task Analysis, Skills Assessments
- Training



#### Pillar 5: Work Management

- Maintenance Workflow
- Work Requests and Work Request Flow
- Identifying work
- Equipment numbering
- Maintenance Backlog
- Priority Systems
- Approval Systems



#### Where to take the CMRP?



The location will be provided if you plan to take the exam.

## Who is Ricky Smith?

Ricky Smith is a well-known Maintenance and Reliability book author, consultant, and best practices educator. Authoring such books as “Rules of Thumb for Maintenance and Reliability Engineers”, “Industrial Machinery Repair”, “Lean Maintenance”, “Failure Reporting Made Simple” and many more.

Ricky has over 30 years’ experience working as a Maintenance and Reliability Professional for companies /organizations such as US Army, Exxon Company USA, Alcoa Mt Holly, Kendall Company, and Life Cycle Engineering. In addition, Ricky worked as a Maintenance Consultant/Educator with hundreds of companies in over 30 countries world-wide.

Ricky is a Certified Maintenance and Reliability Professional (CMRP), a Certified Maintenance and Reliability Technician (CMRT) and a Certified Reliability Leader (CRL).

Ricky worked as a Maintenance Professional at Alumax Mt Holly, later became Alcoa Mt Holly – the first plant in the world Certified as having a “World Class Maintenance” Organization establishing Ricky’s foundation for Maintenance Best Practices.

**Questions? Send your request to [rsmith@worldclassmaintenance.org](mailto:rsmith@worldclassmaintenance.org)**

**SEE REGISTRATION FORM ON NEXT PAGE**



**Workshop Registration Workshop:**  
**Maintenance Best Practices / SMRP Body of Knowledge**  
**Dates: April 27-29, 2021**

**Time: 8:30 – 4:30 ET**

**Location: Live and Virtual Option - Southern Wesleyan University (4 miles from Clemson, SC) and Virtual via Zoom (Internet)**

**Cost: \$750.00 USD for Workshop Only**

**Cost \$1400.00USD for Workshop plus SMRP Membership and CMRP Exam**

**Attendee Name:** \_\_\_\_\_

**Position:** \_\_\_\_\_

**Email Address:** \_\_\_\_\_

**Company Name:** \_\_\_\_\_

**Credit Card**

**Name on Card:** \_\_\_\_\_

**Credit Card Number:** \_\_\_\_\_

**Expiration Date:** \_\_\_\_\_

**CVV:** \_\_\_\_\_ (numbers on back of card)

**Zip Code:** \_\_\_\_\_

**Purchase Order (Terms Net 10):** \_\_\_\_\_

**Company Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

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**Company Contact Person:** \_\_\_\_\_

**Contact Person Email Address:** \_\_\_\_\_

**Zip Code:** \_\_\_\_\_

**Check:  Make checks out to “World Class Maintenance”**

**Questions? [Rsmith@worldclassmaintenance.org](mailto:Rsmith@worldclassmaintenance.org)**

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