Certified Reliability Centered Management Professional

5-Day *Professional Certification Course* Outline

DAY ONE

Industrial Reliability Centered Maintenance

- History of RCM, RCM2 and iRCM
- iRCM as a Business Strategy and a Scientific Process
- Process Based Management
- The Pareto Principle in Failure Analysis 80/20 Rule
- Concentrating on the Critical Bad Acting Equipment
- Organizational Growth under RCM / iRCM

Understanding Machine Failures

- Inherent vs Operational Reliability
- The 5 Main Failure Studies
- Failure Curve Analysis
- Human Factors and Random Failures
- Understanding Secondary and Collateral Damage
- The P-F Curve
- Collateral Damage Limit
- P-F Interval vs What really works!
- Fire Fighting – The Vicious Loop
- A Better Way Forward
- Real Costs of Downtime

Best Practices - General Areas of Operational Reliability

- Effective Best Practice – Not Copying others failures!
- Types of Human Factors affecting Asset Failures
- Technology and Techniques to reduce Asset damage
- Examples of General Maintenance Best Practices
- **Designing** Effective Best Practice Programs
  - Considerations, Objectives and Pitfalls

General Maintenance Management Practices

- Justifying Staffing Levels
- Benchmarking Metrics
- Team Building
- Staffing Justification
- Effective Team-Building
- Performance Reviews

DAY TWO

Lubrication Best Practices

- Need for Change
- Organization and Labeling
- Filtration and Integrity
- Error Proofing
- Technology needed
- Human Factors
- Plant Layout and Survey
- Delivery Plans

Oil Sampling Best Practices

The FMECA Process – How to do an Equipment Systems Criticality Analysis

- Determining Critical Bad Acting Assets using the FMECA.
- FMEA vs FMECA
- FMEA is for design! Not RCM!
- How to Perform a proper FMECA
  - Functional Failure Mode Mapping
  - Risk Analysis and Criticality Scoring
  - Operational Criticality Scoring
  - Safety and Environmental Criticality Scoring
  - Keep Safety as a separate Discipline
- What you know and do not know after a FMECA

FMECA Workshop

- Practicing the Process in a Team
- Choosing a System to Analyze
- Functional Failure Modes Mapping
- Risk Analysis Process
- Each Team Discuss the Experience with the Entire Class
    - What was Easy?
    - What was Difficult?
    - What Questions did this exercise raise?

DAY THREE

Strategic Maintenance Planning

- Using Strategic Maintenance Plans to manage the Bad Acting Assets that are critical to production.
- Part Failure Modes Analysis
    - Past Parts Failures and Common Parts Failures
- PdM Technology Selection
- PdM Frequency
- Considering Collateral Damage in the PF interval
- Critical Work Specifications
    - What can we do to head off the next failure?
    - Shut Downs and turn Arounds.
- Critical Inventory Spares List
    - How to Identify Critical Spare Parts
    - How to Develop Critical Parts Kitting
    - Special Considerations
- Re-Commissioning or Work Completion Specs
- Reviewing Process SOPs for Reliability
- Strategic Shut-Down and Turn Around Procedures
- Optimizing PMs for Reliability

Reliability vs Quality

- Differences and Similarities
- Exploring both as a scientific Phenomenon
- Differences in management approaches to achieving both

Organizational Management and Culture Change

- Organizational vs Departmental Functions
- Review of Corporate Values and Organizational Culture.
- Organizational Values
- High Performance Values
- False Values
- Value Streams and their Effects on Culture
- Organizational Culture Change
- Leveraging Maslow's Pyramid to Affect Change

Human Needs and Motivational Behavior

- Intro to Maslow's Needs
- Leveraging Maslow to Motivate and Affect Change

DAY FOUR

Planning and Scheduling Best Practices and KPIs

- Why Plan and Schedule?
- Basic Concepts & Business Benefits
- Equipment Maintenance Plans
- Planning Targets
- Typical performance KPIs
- Why Planning and Scheduling fails to effectively address Reliability in many cases!
- Getting Serious about Planning and Scheduling as a **Reliability Best Practice**

Equipment Reliability

- **Areas that Influence Inherent Reliability**
  - Cooling
  - Lubrication
  - Static Loading
  - Dynamic Loading
  - Maintainability

Plant Process Reliability

- Process Based Management
- Capacity Factor
- Failure Rates - 1/MTBF
- OEE and TEEP
- Reliability Numbers and Process Flows
- Reliability Engineers Job Description

DAY FIVE

ISO 55000 The Risk Based Asset Management Standard

- **Overview of the new standard**
- **5 Pillars of Asset Management Excellence**
- **How iRCM integrates with ISO 55000**
- **What is a SAMP**
- **What is an AMP**
- **How it all ties together**

LUNCH BREAK

Review of test taking procedures and techniques

- Practice Exam Questions
- CRCMP Exam Registration and Instructions

2:30 PM: CRCMP Written Exam - 110 Multiple Choice Questions

- Time allotted – 2.5 hours. Minimum Passing Score 68%

TRAINING FINISHED

CRCMP Exam Registration Cost - $400 USD (Should be paid in advance)
Optionally Included in the Package Price.
Wait for exam results is typically 1-3 days, depending on number of delegates.
Registration and fees payment with the ICRCM must be completed at least one week prior to training date. This is to assure the proper number of training and Exam Packages are available and on-hand.