ARP Category I – Advocate – Manager - Engineer Awareness

Asset Reliability Practitioner Training & Certification

CAT-I

The Asset Reliability Practitioner [ARP] Category I "MANAGER-ENGINEER AWARENESS" course is intended for senior management, maintenance and operations/production management, engineers, junior reliability engineers, and condition monitoring professionals who need to understand the "big picture" of the reliability and performance improvement process.

Detailed topic list:

INTRODUCTION

- Overview of reliability and performance improvement
- What causes equipment to be unreliable or perform poorly
- The relationship between reliability improvement and asset management, operational excellence, TPM, and lean strategies
    - An introduction to ISO 55000
- The relationship between reliability and safety

BENEFITS

- An overview of the benefits, with basic examples

ASSESSING YOUR BENEFITS

- What is important to your business?
- What are you good at, where do you need help?
- What do those gaps cost you?

CULTURE CHANGE

- The importance of developing the culture of reliability
- The steps necessary to change people's and an organization's culture
- Being aware of human error and human psychology (e.g. biases)
- The importance of defining who is responsible and accountable, who will provide support, who should be consulted, and who should be kept informed [RASCI]

SELLING SENIOR MANAGEMENT

- Building the business case based on the goals of the business, the identified gaps, and the value gained by closing those gaps
- How to ensure you gain and retain senior management support

STRATEGY

- What is involved in developing a strategy
    - Setting goals
    - The need for a mission/vision statement
    - The main components of a "roadmap" strategy
    - The need to establish a "steering committee"
    - Gaining support across the organization

UNDERSTANDING FAILURE

- Why does equipment fail?
    - Mechanical failures
    - Electrical failures
- Understanding equipment "failure patterns"
    - Does all equipment wear out with age?
    - What are "random failures"
    - Early age "infant mortality" failures
- Why is this so important?

DEFECT ELIMINATION

- Overview of the goals of defect elimination
- An overview of each of the main sources of defects and how to eliminate them
    - Design for reliability, maintainability, operability, and sustainability
    - Procurement for lowest life cycle costs
    - Transport without damage
    - Acceptance testing to reject defective equipment
    - Storage to eliminate degradation
    - Eliminating maintenance induced failures through precision installation, maintenance and commissioning
    - Eliminating operator induced failures
    - Proactive tasks that reduce the likelihood of failure and poor performance

ASSET STRATEGY

- Overview of run-to-failure, condition-based, and interval-based maintenance
- The need for the master asset list and bill of materials
- Establishing the asset criticality ranking
- Utilizing Preventive Maintenance Optimization [PMO], Reliability Centered Maintenance [RCM], and/or Failure Modes Effects (and Criticality) Analysis [FMECA] to develop the asset reliability strategy
- Operator driven reliability [ODR]

WORK MANAGEMENT

- The benefits of coordinated, planned, and scheduled work
- An overview of the complete cycle: work requests, planned tasks, kitting, scheduling, managing break-in work, precision job execution (and the need for written procedures), job feedback and improvement
- The opportunity to improve work efficiency (or "wrench time")
- How planning can minimize time/costs with shutdowns and outages
- The role of the computerized maintenance management system [CMMS] or enterprise asset management [EAM] system

SPARES MANAGEMENT

- The financial and work management benefit of efficient spares management
- Basic introduction to spares selection
- Caring for spares

PRECISION AND PROACTIVE WORK

- What is precision and the importance of precision work
    - The basics of precision shaft and belt alignment, soft foot correction, fastening, machine balancing, and other common mechanical and electrical tasks
    - The importance of developing and following written procedures
    - The importance of precision installation, such as bearings, seals, gears, belts, pumps, electrical equipment, and other equipment
    - The importance of commissioning
- The importance of taking proactive steps to avoid future problems, including precision lubrication, resonance correction, power quality control, and keeping equipment and workplaces clean and organized

CONDITION MONITORING

- Overview of CM principles for mechanical and electrical equipment
- The relationship between CM and planning/scheduling and operations
- A detailed overview of:
    - Vibration analysis
    - Ultrasound
    - Oil analysis
    - Wear particle analysis
    - Electric motor testing
    - Infrared analysis
    - Non-Destructive Testing [NDT]
    - Process/performance monitoring
    - Visual inspections
- The future of CM and predictive analytics

BREAKING OUT OF REACTIVE MAINTENANCE

- What to do if you are trapped in the reactive maintenance cycle

CONTINUOUS IMPROVEMENT

- The principle of and importance of continuous improvement, Kaizen, PDCA, and Lean
- The need to reassess business conditions and what is critical
- Utilizing metrics to measure and improve performance
    - Benchmarking against industry and the facilities "best day"
    - The importance of establishing the right KPIs
    - Suggested metrics and KPIs and the most effective use of KPIs
    - The importance of accurate data collection
- The importance of constant communication
- Root cause (failure) analysis [RCA and RCFA]
    - The importance of conducting RCA/RCFA
    - The importance of making the improvements
    - How to perform RCA/RCFA
- The need for on-going education, skills, and awareness training

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CONTACT US
k.ibrahim@uptimedigitalsolutions.com
www.uptimedigitalsolutions.com

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