

# ARP Category I-III courses

## **CATEGORY I: ADVOCATE\***

\*The Category I: Advocate certification may be achieved by following one of two training paths we offer, which depend on your role in the plant and if your intended outcome of the training and certification program will result in reliability engineering and program management positions.

### (TRACK A) PLANT-WIDE AWARENESS

The Asset Reliability Practitioner [ARP] Category I “PLANT-WIDE AWARENESS” course is intended for everyone working within an organization who in any way influence the management, design, engineering, procurement, maintenance, or operation of an organization that involves critical rotating machinery and electrical equipment.

### (TRACK B) MANAGER-ENGINEER AWARENESS

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.

## **CATEGORY II: RELIABILITY ENGINEER CORE EDUCATION**

The Asset Reliability Practitioner [ARP] Category II “RELIABILITY ENGINEER CORE EDUCATION” course is intended for industrial reliability engineers charged with helping the organization improve reliability and performance, and for anyone else in the organization who desires to have an in-depth knowledge of the reliability and performance improvement process. The role of reliability engineer has a critically important but challenging role. In most organizations there are almost infinite opportunities for improvement but understanding what to change and how to change it is difficult. This course teaches you that analysis is not enough, and how the reliability engineer can drive the actions necessary to realize change.

## **CATEGORY III: RELIABILITY PROGRAM LEADER**

The Asset Reliability Practitioner [ARP] Category III “RELIABILITY PROGRAM LEADER” course is intended for those who have taken the lead role in the reliability and performance improvement program. Great responsibility comes with this great opportunity, and the aim of this course is to set you up for success.

While technical knowledge is an advantage in this role, it is essential that the program leader can lead people, communicate frequently and clearly, and have strong budget and project management skills. You must have a crystal-clear vision of how the program will benefit the business and its employees, and a detailed plan, with milestones on how to achieve those goals. A reliability program leader must also understand the nature of the challenges that you will face and have a proactive strategy for overcoming those challenges.

# Training Course Content and Details

The Mobius Institute Asset Reliability Practitioner (ARP) training and certification scheme recognizes the knowledge and basic experience of people at three levels: CATEGORY I; the Advocate who contributes to the initiative, CATEGORY II; the Reliability Engineer, and CATEGORY III; the Leader of the reliability and performance improvement program. The ARP training is comprehensive at all levels. The following table details all the topics and the relative depth of those topics for each category level:

## CATEGORY I-III TRAINING TOPIC DETAILS

□ = Brief Overview   ■ = Some detail   ■■ = More detail   ■■■ = Very detailed   ■■■■ = Extremely detailed

| STRATEGY AND IMPLEMENTATION             |            |             |              |
|-----------------------------------------|------------|-------------|--------------|
| Reliability improvement strategy topic  | Category I | Category II | Category III |
| General overview                        | ■          | ■■          | ■■■          |
| Business process review                 | □          | ■           | ■■■          |
| Business case                           | □          | ■           | ■■■          |
| Asset management                        | □          | ■           | ■■■          |
| Reliability improvement implementation  | □          | ■■          | ■■■■         |
| Operational excellence                  | □          | ■           | ■■           |
| Project management                      |            | ■           | ■■           |
| Maintenance strategies                  | ■          | ■■■         | ■■           |
| Reactive maintenance                    | ■          | ■           | ■            |
| Condition Based Maintenance             | ■■         | ■■          | ■■           |
| Preventive (interval based) maintenance | ■          | ■■          | ■■           |
| Run-to-failure maintenance              | ■          | ■           | ■            |
| Preventive Maintenance Optimization     | ■          | ■■          | ■            |
| Operator Driven Reliability             | ■          | ■■          | ■            |

  

| PEOPLE MANAGEMENT               |            |             |              |
|---------------------------------|------------|-------------|--------------|
| People management topic         | Category I | Category II | Category III |
| General overview                | ■          | ■           | ■■■          |
| Leadership                      | ■          | ■           | ■■■          |
| Culture change                  | ■          | ■■          | ■■■■         |
| Project management              | □          | ■           | ■■           |
| Human error                     | ■          | ■■          | ■■           |
| Human relations                 |            | ■           | ■■■          |
| Knowledge and skills assessment |            |             | ■■■■         |
| Training and education          | ■          | ■■          | ■■■■         |
| Certification                   | ■          | ■           | ■■           |

| DEFECT ELIMINATION             |            |             |              |
|--------------------------------|------------|-------------|--------------|
| Defect elimination topic       | Category I | Category II | Category III |
| General overview               | ■          | ■■          | ■■■          |
| Design                         | ■          | ■■          | ■■■          |
| Purchasing                     | ■          | ■           | ■■■          |
| Transportation                 | ■          | ■■          | ■■           |
| Spares management              | ■          | ■■■         | ■■■          |
| Storage                        | ■          | ■■■         | ■■           |
| Planning and Scheduling        | ■          | ■■          | ■■           |
| Installation and commissioning | ■          | ■■■         | ■■           |
| Project management             | ■          | ■■          | ■■■          |
| Operation                      | ■          | ■■          | ■■■          |
| Acceptance Testing             | □          | ■■          | ■■           |
| Root cause analysis            | ■          | ■■■         | ■            |

| ASSET STRATEGY DEVELOPMENT                |            |             |              |
|-------------------------------------------|------------|-------------|--------------|
| Asset strategy development topic          | Category I | Category II | Category III |
| General overview                          | ■          | ■■          | ■■           |
| Master asset list                         | □          | ■■          | ■            |
| Bill of materials                         | □          | ■■          | ■            |
| Asset Criticality Ranking                 | ■          | ■■■         | ■■           |
| Failure Modes Effects Analysis            | □          | ■■■■        | ■■           |
| Reliability Centered Maintenance          | ■          | ■■■■        | ■■           |
| Preventive Maintenance Optimization [PMO] | ■          | ■■■■        | ■            |

| RELIABILITY ENGINEERING       |            |             |              |
|-------------------------------|------------|-------------|--------------|
| Reliability engineering topic | Category I | Category II | Category III |
| General overview              |            | ■■          | ■            |
| Reliability block diagrams    |            | ■■          |              |
| Reliability analysis          |            | ■■■         |              |
| Lifecycle costing             |            | ■           | ■            |

| WORK AND SPARES MANAGEMENT                              |            |             |              |
|---------------------------------------------------------|------------|-------------|--------------|
| Work management topic                                   | Category I | Category II | Category III |
| General overview                                        | ■          | ■■          | ■■■          |
| Maintenance Repair and Overhaul (MRO) spares management | ■          | ■■■         | ■■■          |
| Maintenance planning                                    | ■          | ■■■         | ■■           |
| Maintenance scheduling                                  | ■          | ■■■         | ■■           |
| Managing break-in work                                  | ■          | ■■■         | ■            |
| Shutdowns, turnarounds and outages                      | ■          | ■■■         | ■■■          |
| Computerized Maintenance Management Systems CMMS or EAM | ■          | ■■■         | ■■■          |

| PRECISION SKILLS (PRECISION AND PROACTIVE MAINTENANCE) |            |             |              |
|--------------------------------------------------------|------------|-------------|--------------|
| Precision skills topic                                 | Category I | Category II | Category III |
| General overview                                       | ■■         | ■■■         | ■■           |
| Shaft alignment                                        | ■          | ■■■         | ■            |
| Balancing                                              | ■          | ■■■         | ■            |
| Fastening                                              | ■          | ■■          | ■            |
| Soft foot                                              | □          | ■           | ■            |
| Looseness correction                                   |            | ■■          | ■            |
| Resonance correction                                   | □          | ■■          | ■            |
| Rolling element bearing installation                   | ■          | ■■■         | ■            |
| Journal bearing installation                           |            | ■           | ■            |

| PRECISION SKILLS (PRECISION AND PROACTIVE MAINTENANCE) <i>continued</i> |     |       |     |
|-------------------------------------------------------------------------|-----|-------|-----|
| Mechanical seal installation                                            | □   | ■ ■   | ■   |
| Electrical installations                                                | ■   | ■ ■ ■ | ■   |
| Verifying electrical systems                                            | ■   | ■ ■ ■ | ■   |
| Power quality                                                           | □   | ■ ■   | ■   |
| Commissioning of electrical equipment                                   | □   | ■ ■   | ■   |
| General principles of installing mechanical components                  | ■   | ■ ■ ■ | ■ ■ |
| General principles of installing electrical components                  | ■   | ■ ■ ■ | ■ ■ |
| Grease lubrication                                                      | ■ ■ | ■ ■ ■ | ■   |
| Oil lubrication                                                         | ■   | ■ ■ ■ | ■   |

| CONDITION MONITORING                   |            |             |              |
|----------------------------------------|------------|-------------|--------------|
| Condition monitoring topic             | Category I | Category II | Category III |
| General overview                       | ■ ■        | ■ ■ ■ ■     | ■ ■ ■        |
| Vibration analysis                     | ■ ■        | ■ ■ ■       | ■ ■          |
| Ultrasound                             | ■          | ■ ■ ■       | ■            |
| Infrared analysis (thermography)       | ■          | ■ ■ ■       | ■            |
| Oil analysis                           | ■          | ■ ■ ■       | ■            |
| Wear particle analysis                 | ■          | ■ ■         | ■            |
| Motor current/voltage/circuit analysis | ■          | ■ ■         | ■            |
| Non Destructive Testing (NDT)          | □          | ■ ■         | ■            |
| Process/performance monitoring         | ■          | ■ ■         | ■            |
| Visual inspection                      | ■          | ■           | ■            |
| Electrical insulation testing          |            | ■           |              |

| CONTINUOUS IMPROVEMENT            |            |             |              |
|-----------------------------------|------------|-------------|--------------|
| Continuous improvement topic      | Category I | Category II | Category III |
| General overview                  | ■          | ■ ■         | ■ ■ ■        |
| Business justification            | ■          | ■           | ■ ■ ■        |
| PDCA/Kaizen/Lean                  | ■          | ■ ■         | ■ ■ ■        |
| Benchmarking                      | ■          | ■           | ■ ■ ■        |
| Key Performance Indicators        | ■          | ■ ■ ■       | ■ ■ ■        |
| Communication                     | □          | ■ ■         | ■ ■ ■        |
| Root Cause (Failure) Analysis     | ■ ■        | ■ ■ ■ ■     | ■ ■          |
| Visual workplace & error proofing | ■          | ■           | ■            |

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