Roadmap to Reliability

START

• Introduction and welcome [10]

• Understanding the polling devices [15]
  o The attendees will be anonymously polled to get their thoughts, experience, and opinion
  o Kick-off poll

• Big picture: What do we mean by “reliability improvement” and the “roadmap to reliability”? [25]
  o Asset management maturity
  o Defect elimination
  o Improved work practices and inventory/spares management
  o Condition based maintenance
  o Precision maintenance and operation
  o Human factors
  o Benchmarking and KPIs
  o Change management
  o Continuous improvement
  o Techniques: RCM, FMEA, PMO, RCFA

• The perils of reactive maintenance [10]

• What are the benefits of improving reliability? [30]
  o Financial
    ▪ Increase in production
    ▪ Reduction of costs
  o Safety and environmental
  o Job satisfaction

• Understanding criticality: an essential component [35]
  o Why do you need it
  o (Ensuring that you have an accurate Master Asset List)
  o Developing the Asset Criticality Ranking

BREAK

• Understanding failure modes [20]
  o Age related versus random failures
  o Common root causes of equipment (mechanical and electrical) failure

• Maintenance practices [20]
  o Run to failure
  o Interval-based
Condition based

- Reliability Centered Maintenance (RCM) overview [30]
  - The goals and basic procedure
  - Recommended approach
  - Determining the required maintenance practices
  - Overlap: PM Optimization, RCM, FMECA, RCFA and reliability improvement

- Reliability engineering overview [20]
  - MTBF and Weibull
  - Data quality – how reliable is your reliability data
  - To measure or to improve

LUNCH

- Defect elimination
  - Design and procurement [15]
    - Maintainability and reliability
    - Life cycle costs
  - Acceptance testing and screening [25]
    - Where do you get the standards
  - Transportation and storage [10]
  - Maintenance practices and precision skills
    - Is maintenance responsible for reliability? [15]
    - Precision maintenance detailed overview:
      - Precision alignment: belt and shaft [20]
      - Precision balancing: shop and in-situ [20]

BREAK

- Precision lubrication and contamination control [40]
- Looseness, clearances, soft foot, correct fastening/torque/tightening sequence [25]
- Resonance elimination [15]
  - Precision operation [30]
    - SOPs
    - Pump operation and BEP
    - Training and awareness
    - Operator driven reliability

END DAY ONE

START DAY TWO

- Condition Based Maintenance
  - Basic principles [10]
o Condition monitoring versus troubleshooting versus condition based maintenance versus condition improvement [15]
o Detailed technology overview
  ▪ Vibration analysis [45]
  ▪ Ultrasound: leak detection, ultrasound assisted greasing plus electrical, mechanical and process applications [25]
  ▪ Thermography (infrared analysis): electrical, mechanical and process applications [30]
  ▪ Oil analysis and wear particle analysis [35]

BREAK
  ▪ Induction motor voltage and current testing [20]
  ▪ Performance monitoring [15]
  ▪ Non Destructive Testing [20]
  ▪ Additional techniques [20]

o Program setup [20]
o Qualifications and certification [10]
o Condition monitoring and reliability [30]

LUNCH

• Implementing the reliability improvement initiative: alternative approaches [20]
  o Detailed RCM analysis
  o Interval-based maintenance
  o Condition based maintenance
  o Consultant driven program
  o Data driven program (and reliability engineering)
  o Internally driven program
  o “Stealth” method versus “leadership driven”

• Benchmarking [25]
  o Knowing your starting point
  o Gap analysis
    ▪ Identifying opportunities
  o Setting some goals

• Running a successful and sustainable program
  o Essential ingredients [40]
    ▪ Leadership
      • Senior management
      • Steering committees
      • Gaining plant-wide support
    ▪ Human factors
    ▪ Culture change
    ▪ Overcoming roadblocks
- Incentives
- Training

**BREAK**

- Roll-out strategy [40]
  - Auditing the current state
    - Plant walk-through
  - *Suggested* step-by-step implementation process
- Continuous improvement
  - Establishing and reporting KPIs [20]
  - Communicating results [15]
  - Root cause failure analysis and FRACAS [30]
    - Determining the root cause
    - Overview of techniques
    - Common sources of good information
    - Taking action to eliminate the root cause
- Why do so many reliability improvement (and condition monitoring) programs fail? [20]
  - Survey results
  - Solutions to common problems

**FINISH**

- Case studies:
  - Many short case studies will be presented during the workshop
  - We will also present numerous short video interviews with successful program managers

- On-line pre- and post-study:
  - To make the most of this learning opportunity you will be provided with an on-line iLearnReliability account (without charge)
  - For two weeks after the workshop you will be able to go through the self-paced, fully-narrated, interactive e-learning modules that use the same animations and simulations that are used in the workshop
  - These modules cover the same topics (and others that we don’t have time to discuss in detail)