Operations Abnormalities And Plant Upset

Energy Milestones Corporation

Advancing Professionals to the next level

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Overview

To survive in today's world of 'lean and mean' operations, we cannot wait for breakdowns. We should make responding to breakdowns the exception in our daily workload, not the norm. A successful and effective maintenance operation must move beyond the 'fix it when it breaks' mentality. The ultimate goal of the maintenance department should be to 'stop' things from breaking, increase the availability and reliability of assets, and do so with the lowest possible cost. This has undoubtedly put immense pressure on the maintenance department management team. In this course, various best practices will be presented that deliver the above objectives.

Course Objectives

At the end of this course, the participants will be able to:

- Demonstrate the latest concepts and techniques required for managing or supervising a maintenance unit
- Examine the organisational and managerial considerations for practical maintenance work
- Apply techniques to measure Overall Equipment Effectiveness (OEE)
- Distinguish and optimise the special characteristics of maintenance activities
- Debunk safety myths, identify unsafe acts and conditions
- Identify standard maintenance Key Performance Indicators (KPIs) and develop the maintenance department scorecard

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Course Content

1. Introduction
   - Fundamental principles
   - Acronyms
   - Plant identification
   - Safety systems

2. Thermal plant configuration and operations
   - Review of plants across Australia (coal and gas-fired)
   - Fuel sources
   - Boiler plant
   - The steam and water cycle
   - Subcritical and supercritical boilers
   - Subcritical and supercritical boilers
   - Turbine plant
   - Condensate and feed water heating systems
   - Generator plant
   - Electrical systems
   - Cooling water systems
   - Balance of plant system

3. Gas turbine plant configuration and operations
   - Gas turbines
   - Fuel sources
   - Turning gear and starter systems
   - Spin modes
   - Fire suppression systems
   - Air intake, air bleed, cooling and drainage systems
   - Compressor water wash systems

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4. Gas turbine operations and control

- Control systems
- Protection systems
- Operating parameters
- Operating procedures

5. Heat Recovery Steam Generator (HRSG) plant configuration and operations

- Diverters
- Heating elements
- Cogeneration
- Cogeneration plants in Australia
- The electricity network
- Australian Energy Market Operator (AEMO)
- Electricity spot market
- Transmission and distribution
- Remote systems
- Case studies

6. Plant operations and control

- Hazards and the appropriate precautions
- Control systems
- Typical elements of plant behaviour
- Burner management and boiler automatic control systems
- Plant permissive and interlocks
- Alarms
- Plant trends
- Protection systems
- Standby plant
- Plant thermal performance and controllable losses

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7. Plant maintenance components
- Maintenance options – essential maintenance VS deferred maintenance
- Condition monitoring – Typical operator issues and problems – Plant history and engineering solutions
- Maintenance priorities

8. Renewable sources of alternative generation
- Physical aspects of hydro, wind, solar, geothermal, and other energy sources.
- How renewable options integrate with conventional generation
- Carbon capture and sequestration
- Environmental licensing and controls

9. Troubleshooting and error management – evaluating case studies
- Competent, safe and reliable operation of the plant
- Abnormal plant and process conditions and the associated incident response mechanisms
- Appreciating inaccuracies with data logging
- Error management
- Troubleshooting
- Case studies

10. Preventing incidents in an insightful way
- Communication skills, improving your insight and intuitive skills to approach people in the right way
- Questioning skills improve your ability to ask the operator relevant, accurate questions that can help improve design efficiencies
- Providing constructive feedback that's well received.
- Questions: Course review and discussion
- Practical assignment

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Targeted Audience

This course is designed to help you effectively manage a plant's day-to-day operations. This will be realised through improved awareness of plant operating principles and practicalities. Those from plants who will benefit from attending are operating staff, engineering staff, technical staff, and supervisory staff.

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be employed before and during the course, as applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role plays
- Indoor & Outdoor games

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